

**AN ASSESSMENT OF THE ENABLING ROLE OF INFORMATION TECHNOLOGY IN  
KNOWLEDGE SHARING AND RETENTION IN ACADEMIC LIBRARIES: A CASE  
STUDY OF MAKERERE UNIVERSITY LIBRARY**

**MINI-DISSERTATION**

**BY**

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**November 2013**

## **DECLARATION**

I, Dianah Twinoburyo Kacunguzi declare that this mini-dissertation is my own work and that I have referenced all sources that I have used. I am certain that this work has not been submitted for any academic award to any institution.

Signed: 

Date: 02 November 2013

Dianah Twinoburyo Kacunguzi

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## **LIST OF ABBREVIATIONS**

DICTs: Directorate of Information and Communication Technologies

IT: Information Technology

KM: Knowledge Management

KS: Knowledge Sharing

KS: Knowledge retention

MUK: Makerere University Library

## **ABSTRACT**

The changes brought about by the dynamic information technology (IT) environment today are a clear signal to academic libraries to move towards adoption of IT developments in knowledge sharing and retention in order to remain competitive. This is because knowledge sharing widens knowledge bases which promotes reuse and retention of knowledge. Unfortunately, knowledge sharing and retention have not been fully adopted by academic libraries which leaves a lot to be desired. This study, therefore, sought to assess the enabling role of information technology in knowledge sharing and retention in academic libraries with a case study of Makerere University Library.

The study adopted a qualitative research approach which lends itself to the interpretive research paradigm and employed interviews and document content analysis as the methods of data collection. A total of six IT staff and six librarians were purposively selected based to avail information for the study.

The major findings of the study revealed that there are various information technologies in Makerere University Library with minimal application of such technologies in knowledge sharing and retention because there is no formal recognition of such knowledge management initiatives. The study, therefore, mainly recommends formal recognition of knowledge sharing and retention as well as continual staff training in the application of IT in knowledge sharing and retention.

**Keywords: Information technology, Knowledge sharing, Knowledge retention, Academic libraries.**

## CHAPTER ONE: INTRODUCTION

*And I have always had an especially great  
desire to learn to distinguish the true from the false,  
in order to see my way clearly in my actions, and to go  
forward with confidence in my life*

*Descartes (1998)*

### 1.1 Introduction

This chapter introduces the study. It covers different aspects of information technology as an enabler in knowledge sharing and retention particularly in academic libraries. Makerere University Library was used as the case for the study in which different library staff participated. The chapter first presents the background to the study and the problem statement. The aim of the study, objectives of the study, conceptual framework, methodology, research limitations, scope of the study, significance of the study, research gap, definition of key terms are then discussed. The chapter finally presents a section on the division of chapters of the mini dissertation.

### 1.2 Background to the study

It is believed that we are in the information age where information technology is of paramount significance to organisations (Etta & Parvyn-Wamahiu, 2003:2). Etta and Parvyn-Wamahiu (2003:2) put forward that “By the 1990s, the world was said to be firmly in the information age”; and “this age is characterized by the emergence of information systems where information is a key resource as well as the new information and communications technologies (ICTs).”

It is important to note that, the information age has steadily given rise to what is known as the 'knowledge age'. This is well articulated by Sharifuddin and Rowland (2004:2) who posit that “We are now moving steadily from an information age to a knowledge age, where knowledge has been recognised as the most important aspect in human life.” Sharifuddin and Rowland (2004:2) further point out that the knowledge age is characterised by numerous changes brought about by information technology. In essence, this means that information technology has a far reaching effect on how knowledge is managed.

In relation to the above, research in the area of knowledge management shows that people and organisations have come to the realisation that information technology is essential to enable

effective knowledge management (King, 2005:1; Choi *et al.*, 2010:2). Lopez and Alegre (2011:645) recognise the fact that information technology provides members of an organisation with the ability to generate, store and rapidly access knowledge. The area of knowledge management largely covers a set of processes including: creating/acquisition, storage, sharing and utilisation of knowledge in order to add value in organisations as well as retain important organisational knowledge (Alavi & Leidner, 2001:113). For the above processes to be effective, organisations should constantly be innovative and apply various technologies in knowledge management initiatives such as knowledge sharing and retention.

Knowledge sharing is considered important in organisations because as knowledge is shared, other employees benefit from it and ensures widening of knowledge bases in an organisation (Quinn *et al.*, 1996:277). It is, therefore, important for organisations to consider implementing knowledge sharing initiatives with the use of technology. In line with this, Lopez and Alegre (2011:645) describe knowledge management technology as an enabler for an appropriate environment for knowledge exchange between people in order to enhance a firm's performance. Every organisation must, therefore, strive to create such an environment to promote knowledge sharing among employees for purposes of retaining such knowledge.

Knowledge retention is of paramount importance to organisations because organisations are becoming more and more dependent on knowledge assets and information technology for gaining a competitive edge. In light of this, Bhatt (2001:68) notes that, "Both business and academic communities believe that by leveraging knowledge, an organisation can sustain its long competitive advantages." Thus, sharing and retention of knowledge is of great importance to organisations. Further still, sharing of knowledge ensures that knowledge moves from one individual to another in an organisation in order to avoid loss of important knowledge (Levy, 2011:583).

It is important to note that knowledge may be lost when experts are laid off, when they retire, when there is a high staff turnover, when there is a merger or acquisition (Martins & Martins, 2011:49; Martins & Meyer, 2011:77). This, therefore, calls for knowledge sharing among individuals in companies and one of the solutions that can enable companies share knowledge effectively in order to outsmart competition is to develop an information technology solution (Ray, 2008:157). Some of the organisations that should embrace knowledge sharing and retention are academic libraries.

Academic libraries are slowly changing to embrace knowledge management activities. Lee (2005:Online) notes, that “The new role of libraries in the 21st century needs to be as a learning and knowledge centre for their users as well as the intellectual commons for their respective communities”. It is further noted that as knowledge centres, libraries should ensure sharing of the knowledge and experience of staff in libraries (Lee, 2005: Online). However, it is important to note that knowledge sharing initiatives are not fully institutionalised in libraries; knowledge management initiatives are not well coordinated to ensure knowledge sharing among librarians, which means that knowledge sharing in academic libraries is carried out informally usually through conversations (Jantz, 2001:35; Maponya, 2004:16; Parirokh, Daneshgar & Fattahi, 2008:119). This problem is not exclusive of Makerere University Library

Makerere University library is strategically located at the heart of Makerere University. Makerere University is one of the oldest and largest academic institutions in East Africa (Makerere University, 2008: Online). The university holds a vision “to be the leading institution for academic excellence and innovations in Africa” while the mission is “to provide innovative teaching, learning, research and services responsive to National and Global needs” (Makerere University, 2008: Online).

In relation to the above vision and mission, the university strives to be the best in the region through aggressive research efforts, building of information systems and strengthening the position of the university library (Makerere University, 2008: Online). The result of these efforts, involves generation of information and new knowledge, storage and sharing of such information and knowledge. It is the university library that takes the central place in the above-mentioned knowledge and information management activities (Musoke, 2010: Online).

Furthermore, it is necessary to point out that Makerere University adopted information technologies in 2004 as an enabler to achieve its strategic objectives (Makerere University, 2013: Online). However, not much of this technology has been used to facilitate knowledge sharing and retention. Worse still, Makerere University Library does not have in place any known knowledge management roles (Musoke, 2010: Online). This means that there is a gap that needs to be filled considering that the university library has been integrating information technology in all its functions including those functions directly or indirectly related to knowledge sharing and retention. The study thus sought to assess the enabling role of information technology in knowledge sharing and retention in academic libraries, particularly Makerere University Library.

### **1.3 Problem statement**

Defining the problem is the most important part of the research process. This is in concert with the notion forwarded by Kothari (2004:26) who emphasizes that the research problem is central to any research project. Al-Ghassani *et al.* (2004:349) note that knowledge management is a relatively new area and is thus not free of problem. Al Ghassani *et al.* (2004:350) attribute most of the problems in knowledge management to lack of a structured approach in the implementation of knowledge management processes and conclude that a proper definition of knowledge management problems is essential if knowledge management projects are to be successful.

Furthermore, Edwards *et al.*, (2003:114) classify the organisations' preferred knowledge management solutions to include technology, people and process based solutions. As already mentioned above in *1.2 Background to the study*, information technology is fundamental in knowledge sharing and retention. This is shown by Saharabudhe (2001:271) who notes that there are a number of knowledge sharing and retention technologies in organisations and Viju (2011: Online) who posits that information technologies play a vital role in sharing, retention and reuse of important knowledge in an organisation.

In regard to the above, the main research problem that guided the study is: the relationship between information technology competency and knowledge sharing and retention in academic libraries for purposes of retaining key organisational knowledge. From the main problem above, the following sub problems were identified to guide the study:

- The relationship between information technology and proper acquisition and storage of knowledge.
- Promoting a knowledge sharing culture using information technology.
- Building information technology based knowledge sharing and retention systems.
- Addressing information technology challenges in knowledge sharing and retention in academic libraries.

In order for the study to address the above-stated problem and sub-problems, the researcher collected sufficient data that was analysed and interpreted which led to presentation and discussion of key findings in chapter 4, and drawing of conclusions and making of recommendations in chapter 5.

### **1.4 Aim of the study**

In consideration of the numerous developments in the IT arena as well as the emergence of the knowledge age where knowledge is a key resource in organisations, it is important to establish a

link between various technologies and various knowledge management initiatives such as knowledge sharing and retention. This study, therefore, aimed at assessing the role of information technology as an enabler in knowledge sharing and retention in academic libraries particularly Makerere University Library.

### **1.5 Objectives of the study**

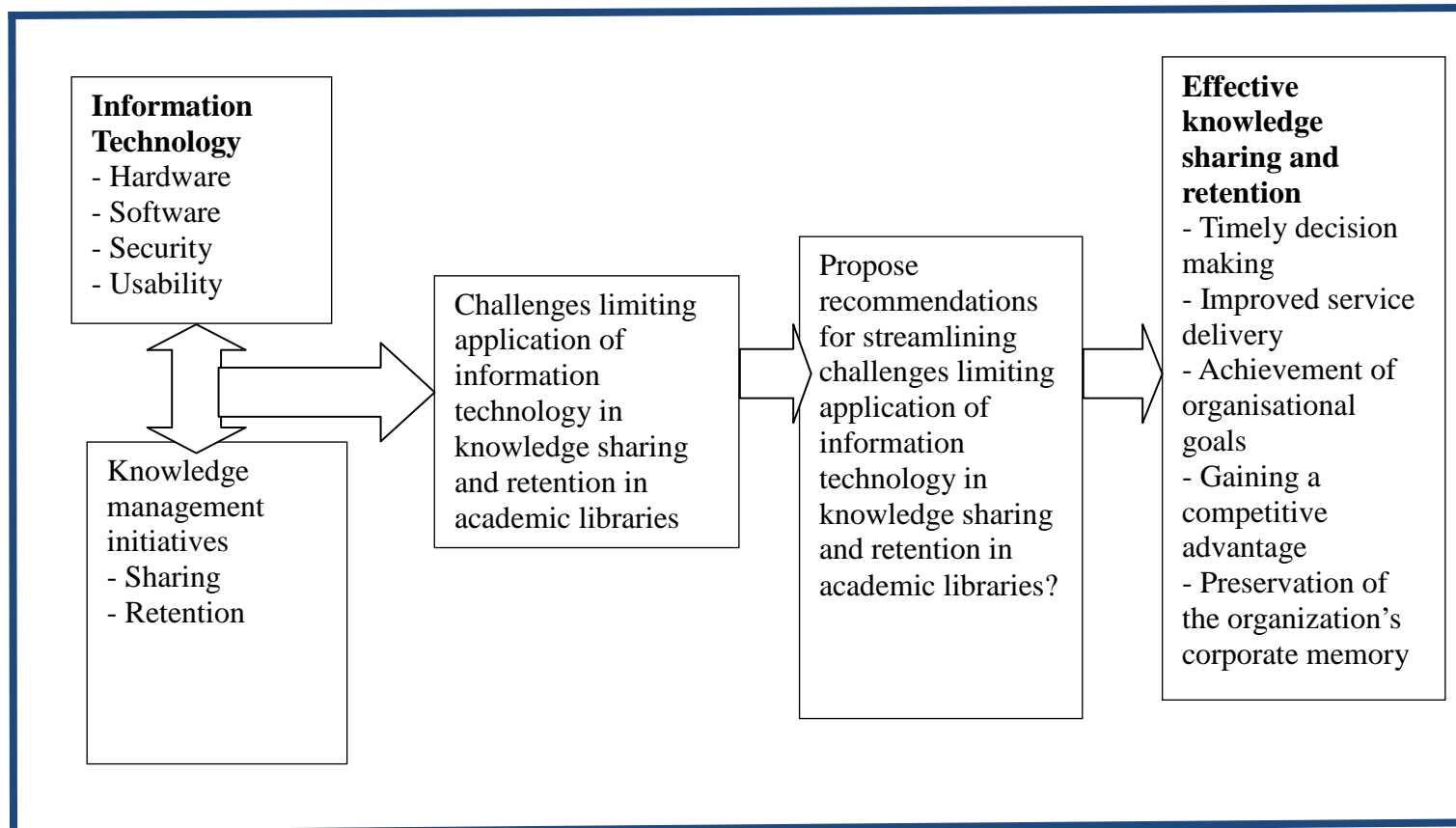
In order to achieve the aim above, the following objectives were identified to guide the study:

1. To assess the level of application of information technology in knowledge acquisition, storage, sharing and retention in academic libraries.
2. To identify relevant technologies that can be used to transform knowledge sharing and retention and thus promote a knowledge sharing culture in academic libraries.
3. To identify the challenges that limit the application of information technology in knowledge sharing and retention in academic libraries.
4. To propose recommendations upon which decisions will be made by academic libraries in the adoption of information technology in knowledge sharing and retention.

### **1.6 Conceptual framework**

There are various interacting factors that can lead to streamlined knowledge sharing and retention with the help of information technology. It is important to examine the independent variables, the intervening variables and the dependent variables. There are two major concepts in the study; namely, information technology and knowledge management initiatives (sharing and retention). According to Vijayakumar and Vijayan (2011: 145), information technology involves hardware, software, security as well as usability which will be applied to knowledge sharing and retention. There are challenges that limit the application of information technology in knowledge sharing and retention in academic libraries. The strategy for addressing these challenges is proposing recommendations for streamlining challenges that hamper the application of information technology in knowledge sharing and retention and this will ultimately lead to the effective sharing and retention of knowledge in academic libraries. As a result of effective knowledge sharing and retention, there will be timely decision making, improved service delivery, achievement of organisational goals, gaining a competitive advantage and preservation of organisational corporate memory. This framework is illustrated below.





**Figure 1.1: Conceptual framework**

## 1.7 Research methodology

The research methodology involves the procedures and methods that were followed when conducting the study as explained below.

The study adopted the interpretive paradigm which portrays the image that there are many truths and many realities and thus focuses on the holistic approach of the person and the environment (Weaver & Olson, 2006:36). This paradigm was relevant to the study because it was important to understand the perspectives and experiences of the IT staff and librarians in relation to their work environment.

In regard to research design, it is important to note that it establishes a connection between the research questions and the data collected (Punch, 2005:63). In line with this, the researcher collected data based on the research sub-problems, which was sorted and interpreted, and from which a research report was compiled. The study adopted a qualitative research approach, which according to Berg (2001:54); Kothari (2004:4); and Stangor (2011:15) is more concerned with defining situations and concepts under study in order to arrive at meaningful and objective

conclusions. For the case of research strategies, the study adopted a literature survey as well as a case study design.

The population for this study consisted of IT staff and librarians at Makerere University Library. The library has a known population of six IT staff who were involved in the study. An additional sample of six librarians was purposively chosen from a known population of 51 professional librarians.

The research adopted a combination of two data collection methods; in particular, interviews, and document content analysis methods were used. The interview method involved face-to-face conversations between the researcher and the respondents while document content analysis is a method that involved analysing content relating to the phenomenon under study. Document content analysis was used to gain additional information from documents such as the Makerere University Library Strategic Plan 2007-2017; staff instructional manuals and library section reports. In relation to the above methods, the following data collection instruments were employed in the study: interview guide, and document review guide. The questions asked in the interviews were linked to the corresponding research sub-problems.

In regard to data presentation and analysis, the researcher edited the data accordingly to do away with mistakes, a process known as cleaning of data. Qualitative content analysis was then used to analyse, describe and interpret data based on the research main problem and research sub problems. According to Powell (2003:2), quantitative content analysis is done in order to have meaningful interpretation and understanding of the data.

It was important to ensure quality of data. The researcher, therefore, ensured that all the data collected and used in the study was accurate and up to date. The researcher constantly checked and verified questions and any other collected information during the process of data collection to ensure completeness and accuracy of data. Pilot testing of instruments was carried out in order to make necessary adjustments for reliability of data to be achieved.

In terms of ethical issues, the researcher followed the appropriate research procedures observed by the University of Pretoria and considered ethical issues of informed consent from respondents,

confidentiality of all the information from the respondents, protection of the respondents' identities, exercise of freedom of thought, intellectual honesty and ensuring independence from possible attempts to bias.

### **1.8 Research limitations**

Creswell (1998:110) shares an opinion that limitations are general shortcomings of a study. Like other empirical researches, this study had some limitations. The researcher, therefore, encountered limitations in the course of conducting the research. Some of the limitations included the following:

- It was not possible for the respondents to be available at all times to respond to the researcher's questions. This is because interview appointments were scheduled between 08:00am and 05:00pm which is considered the official time for work. However, the researcher ensured that appropriate follow-up on respondents was done in order to avoid any delays in data collection
- There was a challenge of time limitation where it was a rather difficult task for the researcher to carry out the entire research project between January and October 2013. The researcher, however, worked tirelessly with the help of the research supervisor to complete the research project in time.

### **1.9 Scope of the study**

It is important to define the scope of the study. The scope of the study was divided into two categories; namely, the geographical scope and conceptual scope as explained below.

#### **1.9.1 Geographical scope**

The study was conducted at Makerere University located in Kampala, Uganda. This is because the university is one of the largest universities in East Africa that acquires/generates knowledge. The study was particularly conducted at Makerere University Library, because the library is involved in knowledge management activities such as knowledge sharing and retention.

#### **1.9.2 Conceptual scope**

The study covered various aspects relating to the enabling role of information technology in knowledge sharing and retention with the aid of information technology. The study further covered IT systems under the control of Makerere University Library. The study, however, did not cover the general IT infrastructure and policies of the university. The historical perspective and the rise of knowledge management in academic institutions was mentioned but not discussed in detail. There

were no comparative studies of knowledge management systems in academic libraries in Uganda but rather only in Makerere University library.

### **1.10 Research gap**

Literature that relates to this study reveals that information technology enhances efficiency in organisations. According to Kurien, Rahman and Purushottam (2004:29), information technologies have added great business value and effectiveness to organisations through their application to business processes. Information technology can thus be an enabler in knowledge sharing and retention in various institutions.

It is, however, noted that not much has been written about knowledge retention. Levy (2011:582) notes that, “....a sub-discipline of knowledge management, knowledge retention, which deals with cases where expert knowledge workers leave organisations after long periods of time, is not fully covered either in academic research or in published business case studies”. In addition, Martins and Meyer (2011:78) confirm that, “Little research has been conducted in the area of organisational knowledge retention with a focus on individual, team and organisational behaviour”. More still, no study on the assessment of the enabling role of information technology in knowledge sharing and retention has been done at Makerere University Library. Therefore, this study sought to fill this gap.

### **1.11 Significance of the study**

The study is important as it comes at a time when there are global knowledge management challenges and technological advancements that have forced today’s organisations or companies to quickly respond in order to survive in a competitive knowledge intensive environment. There is also great need for academic libraries to relate information technology with knowledge sharing and retention at an applicable level for effectiveness and achievement of organisational goals. This significance is explained below:

1. It is believed that the study will inform academic institutions and libraries about the need to apply information technology as an enabler for knowledge sharing and retention.
2. The research will provide decision-makers and policy makers with information about the challenges in knowledge sharing and retention as well as information about how to overcome the challenges of applying information technology in knowledge sharing and retention.
3. The study, further, will contribute new knowledge to the academic circles at Makerere University because the study can be used as a basis for further research in the area of knowledge management especially on aspects of knowledge sharing and retention.

4. The study can be useful to other organisations other than academic libraries that wish to explore the application of information technology in knowledge sharing and retention.

## **1.12 Definition of key terms**

It is important to define the key terms of the study including information technology, knowledge, and knowledge management. The key terms above are defined below.

### **1.12.1 Information technology**

Information technology is arguably one of the most discussed topics in research and has, thus been broadly defined by various authorities. According to Rajaran (2003:1), information technology is defined as “the technology which is used to acquire, store, organise, and process data to a form which is usable in specified applications, and disseminate the processed data”. Information technology in simple terms is the application of hardware and software in the management and manipulation of data and information.

### **1.12.2 Knowledge sharing**

Knowledge sharing is about the exchange of ideas, information and knowledge between individuals or groups of people (Janus-Hiekkaranta, 2009:48). In another view, knowledge sharing is defined as an experience individuals go through when they pass on organisationally relevant knowledge to others by establishing knowledge requirements and when to pass on knowledge (Bartol & Srivastava, 2002:23; Ramirez, 2007:Online). Knowledge sharing for the sake of this study is passing on what individuals know so as to expand knowledge bases in an organisation.

### **1.12.3 Knowledge retention**

According to Levy (2011:583), knowledge retention is a field that deals with issues relating to experts' knowledge becoming a valuable organisational asset whereby experts are expected to pass on what they know to avoid knowledge loss. For this study, knowledge retention is perceived as efforts geared at sharing knowledge from experienced employees so that such knowledge can be reused by other employees.

### **1.12.4 Academic libraries**

According to literature, an academic library can be defined as an entity in an academic institution that provides a wide range of information services (Carey, Justh & Williams, 2003:4). Academic libraries employ a number of staff among which are academic librarians. This study uses the term academic libraries to mean units within academic institutions that support research and education by

providing timely information through the efforts of academic librarians.

### **1.13 Division of chapters**

In order for the research to be complete, the researcher compiled five chapters of the research report as summarised below.

#### **Chapter one: Introduction and aim of the research**

This is the introductory chapter for the research report. The chapter introduces the research problem which is supported by research sub-problems. The chapter further provides a background to the study and a formulation of the research aim and objectives. A conceptual framework is provided in this chapter to explain the relationship between various variables in the study. A brief account of the methodology adopted for the study is given as well as the research limitations. Other areas covered in this chapter include the scope of the study, research gap, significance of the study and definition of key terms as well as division of chapters.

#### **Chapter two: Literature review**

This chapter discusses a review of literature related to the enabling role of information technology in knowledge sharing and retention in academic libraries in order to establish how the study fits within the wider body of knowledge. This chapter, therefore, covers: an overview of knowledge management; detailed explanation of the importance of knowledge sharing and retention in academic institutions; a discussion on the role of academic libraries in knowledge sharing and retention; the application of information technology in knowledge sharing and retention; challenges in knowledge sharing and retention; and information technology best practices in knowledge sharing and retention in academic institutions and libraries.

#### **Chapter three: Methodology**

This chapter covers the detailed methodology adopted for the study. The areas covered under this chapter are: the research paradigm; research design; research approach; research strategies; population of study; sampling; data collection methods; data collection instruments; application of questions to the study; data analysis and presentation; quality assurance; and ethical issues.

#### **Chapter four: Presentation and discussion of findings**

This chapter presents and discusses key findings of the study. The findings were obtained using the research collection methods/instruments which are discussed in chapter three. The presentation of findings is done in accordance to the research sub-problems while the discussion of findings is in

relation to related literature.

## **Chapter five: Summary of findings, conclusions and recommendations**

This is the last chapter of the research report and it presents the summary of major findings, conclusions about major findings, recommendations for addressing factors that limit application of information technology in knowledge sharing and retention in academic libraries. This chapter provides an insight into areas for further research.

### **1.14 Conclusion**

This chapter has introduced the research problem upon which all the other chapters are based. The research problem is supported by research sub-problems that guide the study. A background to the study is provided to support the research problem. Other areas explored in this chapter are the aim of the study and objectives of the study which are derived from the main research problem. ,

In addition, the conceptual framework, methodology, research limitations, scope of the study, significance of the study, definition of key terms, division of chapters and referencing style used in the dissertation are discussed in this chapter. This chapter, therefore, introduces major concepts that guided the study. The next chapter is chapter two and it discusses literature related to the study.

## CHAPTER TWO: LITERATURE REVIEW

*It is in knowledge, as in swimming, he who  
flounders and splashes on the surface, makes more  
noise, and attracts more attention than the pearl-diver  
who quietly dives in quest of treasures to the bottom*  
Washington Irving (1783-1859)

### 2.1 Introduction

This chapter presents a review of relevant literature to the enabling role of information technology in knowledge sharing and retention in academic libraries. The chapter consists of several sections such as: a) an overview of knowledge management which presents the meaning of knowledge management and knowledge management processes, knowledge sharing, knowledge retention and challenges in knowledge sharing and retention; b) a detailed explanation of the importance of knowledge sharing and retention in academic institutions; c) a discussion on the role of academic libraries in knowledge sharing and retention; d) the application of information technologies in knowledge acquisition, storage, sharing and retention; and e) information technology best practices in knowledge sharing and retention in academic institutions and libraries.

The purpose of reviewing this literature was to establish what has been written in relation to the subject under study in order to identify gaps that literature sources have not filled and subsequently attempt to fill these gaps by relating findings of the empirical to literature.

### 2.2 An overview of knowledge management

Knowledge management is increasingly becoming a popular subject as shown by Hislop (2009:1) that it became a topic of great interest among academicians, policy makers, business partners and consultants since the mid-1990s (Hislop, 2009:1). It is further explained that the increasing interest in knowledge management is visible through the increased research publications such as academic articles and books as well as the emergence of a number of conferences on the topic and blossoming knowledge management consultancies at the beginning of the 21<sup>st</sup> Century (Kluge, Stein, & Licht 2001:9; Hislop, 2009:2). It can thus be noted that the study of knowledge management has become common over the years.



Furthermore, it is important to note that understanding the field of knowledge management is not straightforward as there are different views on the topic. This same stance is held by Lopez and Alegre (2011:645) who posit that the concept of knowledge management has been studied from various approaches and views which render difficulty in concretely defining and understanding aspects of the concept. The various views on the concept knowledge management include Robbins' (2003:575) view that knowledge management involves ensuring that an organisation's collective wisdom is organised and distributed to the right people at the right time. Further still, knowledge management is considered to be a process of transforming information into valuable knowledge as well as using knowledge from past experiences for good decision-making (Van Beveren, 2002:19; Jennex & Olfman, 2006:53).

In a more specific approach, Hislop (2009:59) considers knowledge management as, "An umbrella term which refers to any deliberate efforts to manage knowledge of an organisation's workforce, which can be achieved via a wide range of methods including directly, through the use of particular types of ICT, or indirectly through the management of social processes ..." Hislop's (2009:59) approach depicts knowledge management as a wide area that involves control of an organisation's knowledge resources through different methods including information and communication technologies.

In other views, knowledge management is related to making decisions based on the creation and evaluation of products and services, innovative practices and new markets to create and disseminate new knowledge in an organisation (OECD, 2004:Online). This echoes Van Beveren's (2002:19) view that employees in an organisation should embrace the application of new knowledge to solve organisational problems and communicate such knowledge. As such, knowledge management can be viewed from two perspectives; that is, the process perspective and outcome perspective (Al-Ghassani, *et al.*, 2004:349). The process perspective considers knowledge management as a process in which knowledge is created, stored, disseminated and utilised while the outcome perspective considers that an organisation derives benefits from managing its knowledge resources (Al-Ghassani, *et al.*, 2004:349).

In a divergent view, Rollett (2003:209) posits that "Knowledge management is a way of thinking and that it is a way of thinking for managers: It draws attention to aspects which previously have often been neglected. In another sense, it is also a way of thinking for all employees: A knowledge-friendly culture increasingly determines the success of the company as a whole." It can, thus, be said that knowledge management is a field with many definitions and approaches.

In order to fully understand what knowledge management is, it is important to understand what knowledge is as well as knowledge management processes and other aspects of knowledge management such as knowledge sharing and retention. This overview, therefore, covers the meaning of knowledge as well as aspects of knowledge management processes, knowledge sharing and retention as presented below.

### **2.2.1 An understanding of knowledge**

Understanding knowledge is essential in knowledge management literature, however, it is noted that knowledge is fundamentally not easy to define (Onifade, 2010:17). It is revealed in literature that organisations often relate organisational success to knowledge; for instance, it is noted that organisations and individuals who have come to the realisation that knowledge is a valuable resource have achieved tremendous success which is a major indication that knowledge is a resource that should not be ignored (Materska, 2004:142).

In regard to the above, Hislop (2009:16) notes that there are two perspectives to understanding knowledge; that is, the objectivist perspective on knowledge and the practice-based perspective on knowledge. From the objectivist perspective, “Knowledge is regarded as an entity/commodity that people possess, but which can exist independently of people in a codifiable form” (Hislop, 2009:19) while the practice-based perspective on the other hand describes knowledge as what people know from their work activities or practices and is thus inseparable from an individual (Hislop, 2009:33).

Knowledge is further classified into tacit knowledge and explicit knowledge. Explicit knowledge is considered as codifiable, impersonal, context independent, easy to share and can be stored in databases, repositories and shared in print and electronic resources (Smith, 2001:315; Hislop, 2009:23). Tacit knowledge on the other hand, is subjective, personal, context specific and difficult to share (Hislop, 2009:23). Furthermore, a great philosopher Polanyi (quoted by Smith, 2001:314) describes tacit knowledge “As knowing more than we can tell, or knowing how to do something without thinking about it, like ride a bicycle.” Nonaka, Toyama and Konno (2000:12) point out that although explicit knowledge and tacit knowledge are different, they exist in the same knowledge sphere as shown in the figure below.



**Figure 2.1: Tacit and explicit knowledge in one knowledge sphere. (Source: Adapted from Nonaka, Toyama & Konno, 2000:12).**

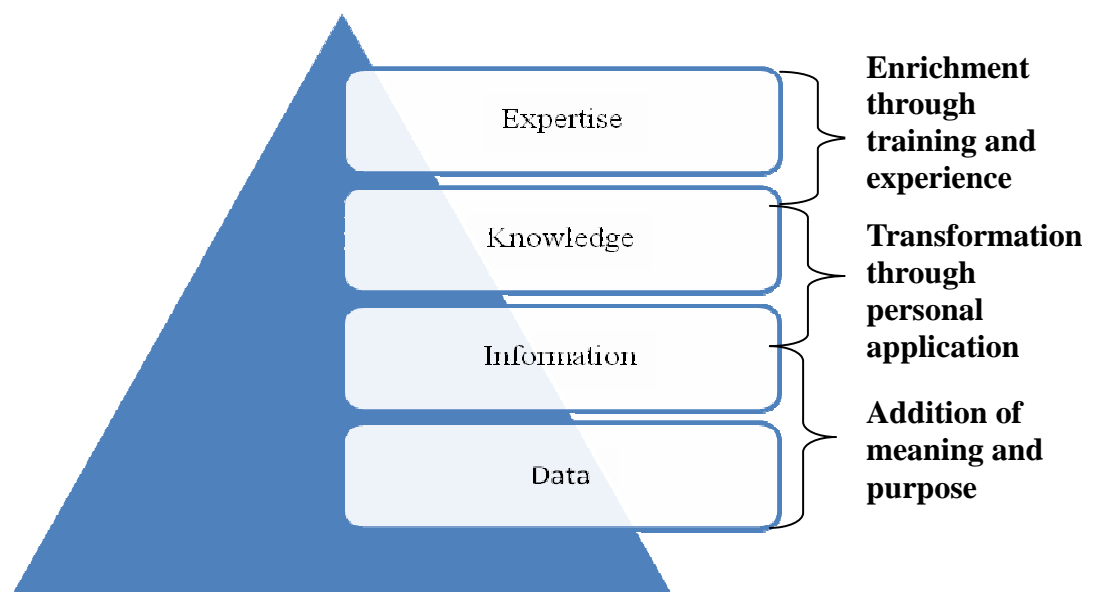
In addition, Rollet (2010:6) notes that, “Knowledge is held by people: by individuals, teams, communities, and organisational units. Relationships between people and between items of content also contain knowledge, as do physical arrangements such as floor layout.” Thus, knowledge can be found in written documents, books, patents, memos, reports, articles, minutes from meetings, list serves, instructional manuals and presentations (Rollet, 2010:6). It is, however, noted that in organisations, knowledge goes beyond documents and repositories to being embedded in business processes, best practices, common mistakes, norms, organisational routines, stories, software and equipment (Rollett, 2003:6; Baets, 2005:216).

More still, as already mentioned above in 2.2 *An overview of knowledge management*, knowledge is often linked to competitive advantage and organisational performance. However, it is pointed out that knowledge is not always utilised to the fullest as pointed out by Claver-Cortes, Zaragoza-Saez and Pertusa-Ortega (2007:47) that knowledge is an important resource in an organisation which should thus not be underutilised because it can promote a competitive advantage as shown in figure 2.2 below.



**Figure 2.2: Knowledge chain for a competitive advantage.** (Source: Adapted from Claver-Cortes, Zaragoza-Saez & Pertusa-Ortega, 2007:47)

Furthermore, Heeks (2008a:2) points out that an individual builds knowledge from data by adding meaning to make it information and applying information to get knowledge which turns into expertise through training, experiences and education and can thus be transferable from one individual to another because it becomes individualised. This hierarchy of knowledge is shown in figure 2.3 below.



**Figure 2.3: The hierarchy of knowledge.** (Source: Adapted from Heeks, 2008a:2).

Although the hierarchy above has been advanced by several authors including Bender and Fish (2003), Schueber (2003), Heeks (2008a) and Heeks (2008b), it has also been criticised by a number of authors such as Eck (1997), Rowley (2007), Fricke, (2009), Weinberger (2010) and Bernstein (2010). One such criticism is that information does not lead to knowledge but knowledge is rather the value of information (Fricke, 2009:131). In addition, it should be noted that although the hierarchy is widely recognised in information science, it can be said that it provides less evidence of the transformation processes from data to information and from information to knowledge as well as from knowledge to expertise (Rowley, 2007:163).

It can thus be argued that the knowledge hierarchy provides sufficient definitions of data, information, knowledge and expertise but less literature exists on the clarity of how data is transformed into information and how information is transformed into knowledge.

The literature above reveals that knowledge can be understood from various perspectives as pointed out by different authorities. It is believed that tacit knowledge contributes to explicit knowledge and vice versa (Srikantaiah, 2001:11). Therefore, for the purposes of this study, a discussion on both tacit and explicit knowledge was included in order to assess how IT can effectively enable sharing and retention of such knowledge. Below is a discussion of the understanding of knowledge management processes.

### **2.2.2 An understanding of knowledge management processes**

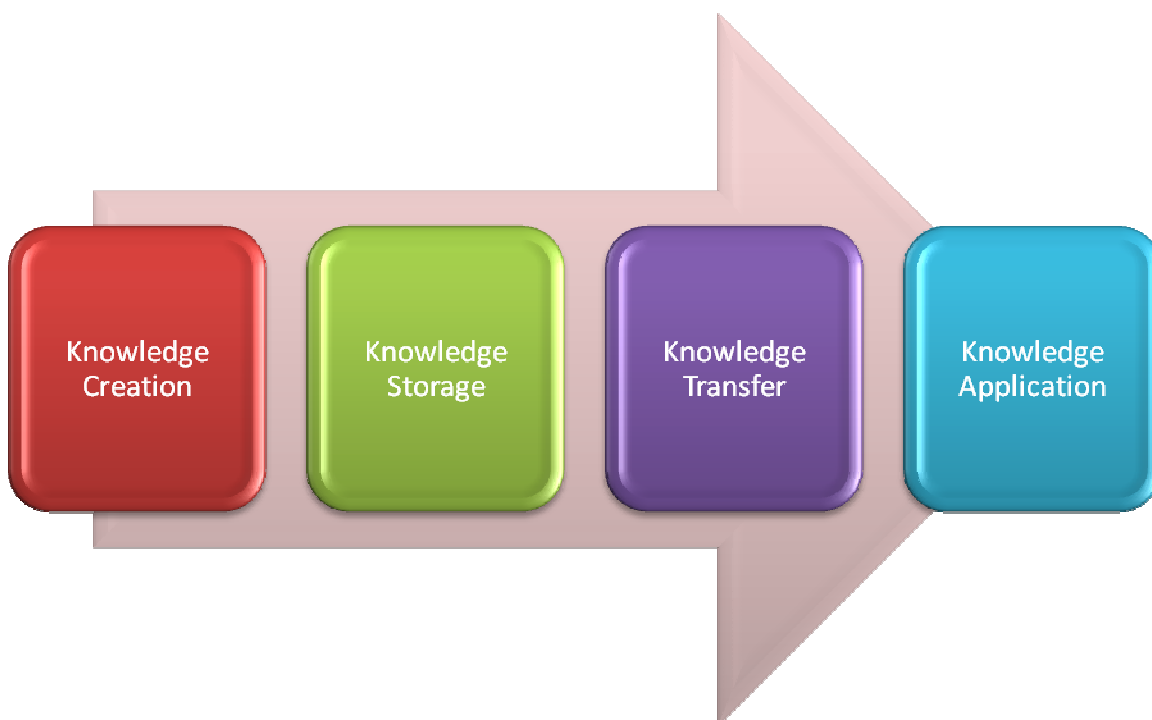
Knowledge management involves systematic control of knowledge resources through a series of processes. Different authors have a common ground on knowledge management processes. The common knowledge management processes put forward in literature by Galagan (1997:22); Alavi and Tiwani (2003:106); and Rollet (2003:11) include the following:

- *Creation/generation/acquisition.* This is aimed at development of new ideas, know-how and capabilities. Newell *et al.* (2002:48) note that knowledge creation is as a result of interaction and collaborative efforts of individuals. In addition, knowledge acquisition can be described as getting access to knowledge from experts through planned extraction from either internal or external sources (Nemani, 2010: Online). More still, acquisition of knowledge can result from subscription to mailing lists, buying of knowledge products, networking with other libraries and attending training programmes, workshops and seminars (Shanhong, as cited in Maponya, 2004:15). Carlsson (cited in Peterson, 2012:106) points out that knowledge

acquisition should be successfully done if there is application of information technology. In addition, it is noted that technology enables the capture of knowledge from routine tasks that is vital for organisational effectiveness (Wiig, 2004:302).

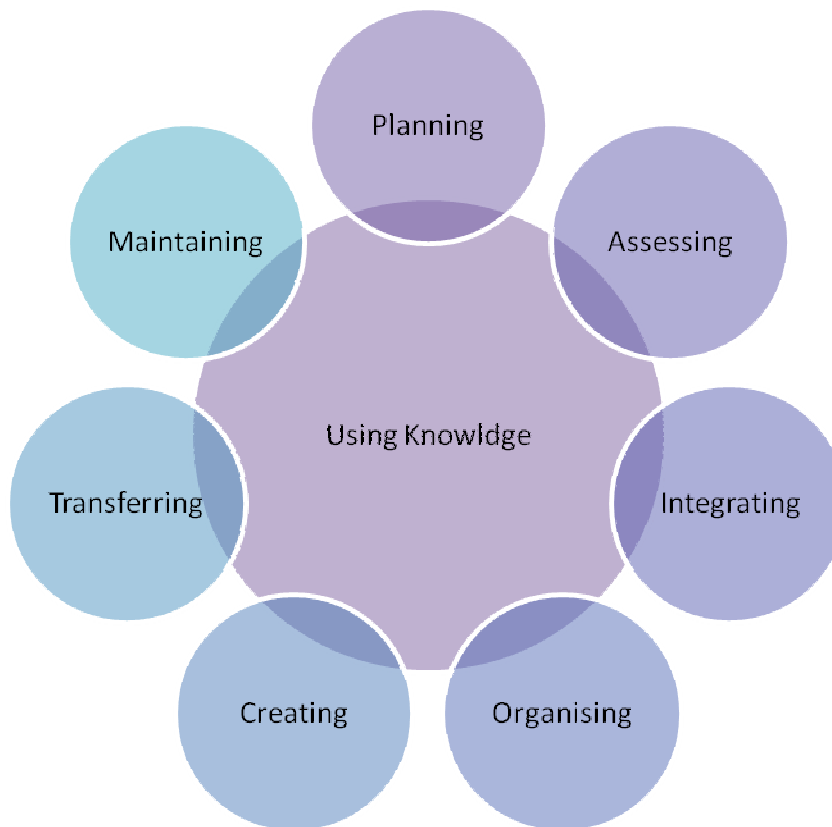
- *Storage/retrieval.* This starts with organising, classifying organisational knowledge into internal and external knowledge as well as representation of knowledge in databases. More still, this includes keeping available knowledge accurate and up to date as well as assessing knowledge which includes measuring the usefulness of available knowledge.
- *Transfer/sharing/providing access.* This involves conveying knowledge from one place to another and from one person to another. In other words, this process includes both planned and unplanned modes of communicating knowledge. Furthermore, knowledge sharing is done through the exchange of ideas and experiences through socialisation practices (Sohail & Daudi, 2009:129).
- *Application.* This involves using knowledge to make timely decisions and solve organisational problems.

The above processes are represented in the figure below.



**Figure 2.4: Knowledge management processes.** (Source: Adapted from Alavi & Tiwani, 2003:106)

More to the above, Rollett (2003:10) advances various stages in the knowledge management process that organisations should consider. These stages are shown in figure 2.5 below:



**Figure 2.5: The process view of knowledge management. (Source: Adapted from Rollet, 2003:10)**

**Planning** in the process above, involves matching knowledge to the context within which it is used (Baets, as cited in Janus-Hiekkaranta, 2009:60). Planning involves setting up of strategic and operational goals, identifying key business processes, understanding organisational requirements, gathering and assessing intellectual capital, evaluating the scope of required knowledge, identifying common knowledge management strategies and linking knowledge planning to other KM processes (Rollett, 2003:11).

**Creating** as part of the knowledge management processes deals with expanding the existing body of knowledge through generation of new ideas or acquiring knowledge that has already been created (Rollet, 2003:11).

**Organising** as shown in the diagram above is part of knowledge management processes and it involves applying intelligent and meaningful processing to information in order to provide clarity of information and provide efficient ways of retrieving knowledge (Raghu & Vinze, 2007:Online).

Various structures are applied in organising knowledge including: thesauri, categorisation schemes, subject headings, knowledge maps, ontologies and term lists (Rollett, 2003:12).

**Integrating** knowledge is a process that is aimed at providing access to an existing body of knowledge in the most efficient manner and thus promotes easy retrieval of knowledge (Raghu & Vinze, 2007: Online). Further still, integrating of external knowledge is an easier task than the process of capturing and storing internal knowledge because different companies have different categories of knowledge that are very difficult to access (Rollett, 2003:12).

**Transferring** of knowledge is yet another important process in knowledge management because knowledge that is well stored and organised is useless to organisations if it cannot be easily transferred to organisational staff to use it (Janus-Hiekkaranta, 2009:61). Transferring of knowledge may be by electronic means especially if a database is well organised and interlinked (Rollett, 2003:12). The aim of transferring knowledge is to facilitate employees to access knowledge from multiple channels, however, an evaluation of such channels should be carried out based on the amount and scope of knowledge to be transferred (Raghu & Vinze, 2007:Online).

It is further noted that knowledge transfer is one of the main processes in knowledge management but the process of transferring knowledge is difficult and complex. This is confirmed by Parent *et al.* (2008:98) who point out that “Difficulties associated with knowledge transfer are not only possible but common place, so much that they should be considered the norm rather than the exception” and that this is; “because, so far, efforts to transfer knowledge have had a distinctly modest record of success”

**Maintaining** knowledge is key in knowledge management processes because knowledge becomes useful and accessible if it is correct and up to date (Janus-Hiekkaranta, 2009:62). The changing technology environment, unpredicted mobility of the workforce, increase in the body of knowledge and security issues can cause disorder in the management of knowledge which calls for preservation and maintenance of knowledge in good order (Janus-Hiekkaranta, 2009:62). It is essential to concentrate on preserving quality of knowledge rather than quantity of knowledge (Rollett, 2003:13).

**Assessing** knowledge is important in knowledge management processes because it involves measuring of intellectual capacity which makes it possible to link knowledge management strategies with operational practices for better control of knowledge resources (Janus-Hiekkaranta,



2009:63). Assessing knowledge is useful in providing information about a group, an individual and organisational knowledge resources for effective communication with stakeholders (Rollett, 2003:13).

The discussion above is a reflection of the views of different authors on knowledge management processes. For purposes of this study, four knowledge management processes of creation/acquisition, storage, transfer/sharing and application as considered by Alavi and Tiwani (2003:106) will be adopted because they relate to aspects of knowledge sharing and retention and are thus relevant to the study.

### **2.2.3 An understanding of knowledge sharing**

Knowledge sharing is commonly mistaken with knowledge transfer but the two concepts are different. This is noted by Janus-Hiekkaranta (2009:48) who points out that knowledge transfer is concerned with the technical processes of moving knowledge from one place to another without changing knowledge properties whereas knowledge sharing is concerned with the exchange of ideas, information and knowledge between individuals or groups of people. In addition, knowledge transfer is formal in nature whereas knowledge sharing can either be informal or formal in nature (Janus-Hiekkaranta, 2009:48).

Knowledge sharing is important in organisations as noted by Quinn, Anderson and Finkelstein (1996:277) that,

“As one shares knowledge with other units, not only do those units gain information (linear growth) they share it with others and feedback questions, amplifications, and modifications that add further value to the original sender, creating exponential total growth and that proper leveraging through external knowledge bases, especially those of specialized firms, customers, and suppliers, can create even steeper exponentials.”

Further still, knowledge sharing is looked at as an experience individuals go through when they pass on organisationally relevant knowledge to others by clearly knowing what knowledge is required and when to pass it on (Bartol & Srivastava, as cited in Onifade, 2010:19; Ramirez, 2007:Online). This means that employees should in turn know what knowledge they require and when to acquire it, which calls for a knowledge sharing culture, thus promoting improved performance in organisations (Probst, Raub & Romhardt 2000:164; Ramirez, 2007:Online; Onifade, 2010:21).

In addition, knowledge sharing can include sharing of explicit or tacit knowledge whereby explicit knowledge can be shared through documentation and verbal means while tacit knowledge can be shared through processes such as socialisation, mentoring and observation (Onifade, 2010:20). More still, knowledge sharing can include knowledge collection and knowledge donating where knowledge collection involves consultations with colleagues to convince them to share their intellectual capital while knowledge donating involves individuals communicating what they know as part of their intellectual capital (Van den Hoof & Van Weenen, 2004:2).

However, knowledge sharing is a complex knowledge management activity. The knowledge sharing complexity has been described in terms of knowledge being sticky. The stickiness problem is advanced by Sanchez and Heene (1997:14) that knowledge is hard to imitate by third parties thus sticking with people. The stickiness problem is associated with the difficulty in transferring knowledge due to the fact that knowledge can be extremely tacit in nature, context specific and complex (Janus-Hiekkaranta, 2009:48). The stickiness problem can even get worse if the source of the knowledge is highly inexperienced and thus unreliable (Sarker & Joshi, 2002:3).

In addition, social barriers can inhibit the process of knowledge sharing whereby employees may not find it necessary to share their ideas or they may not even have the time to share their experiences (Wang, Yang & Chou, 2007:536). More still, the employees involved may not have the interpersonal and communication skills to share the knowledge and worse still, top management may not support knowledge sharing initiatives (Sarker & Joshi, 2002:3).

Despite the knowledge sharing challenges above, there are several knowledge sharing mechanisms in organisations. Bartol *et al.* (cited in Onifade, 2010:20) point out knowledge sharing mechanisms that can be applied in organisations as shown below:

- Adding valuable knowledge to organisational databases.
- Instituting formal procedures for sharing knowledge between teams across the organisation.
- Promoting informal knowledge sharing among individuals.
- Promote sharing of knowledge within communities of practice.

It is important to note that there are several environmental factors that promote knowledge sharing in organisations such as:

- *Trust.* This is regarded as an essential part of collaborative efforts where high mutual trust can lead to high performance (Peariasamy & Mansor, 2008:89). In addition, it is noted that “trust and group identification will encourage positive attitudes toward knowledge sharing and will therefore, be positively related to knowledge sharing intentions and behaviours” (Cabrera & Cabrera, 2005:3). Organisational teams, thus, need trust to promote sharing from experts which reduces chances of employee turnover and protects against the loss of tacit knowledge (Von Krogh *et al.*, 2000:129; Paavola, Lipponen & Hakkarainen, 2004:560). It is, accordingly, important that organisations engage in “promoting an environment in which employees have the opportunity to develop both competence- and benevolence-based trust needs to be a central part of an organisation’s knowledge management agenda.” (Levin *et al.*, 2002: Online).
- *Communication.* A study conducted by Laupase (2003:92) reveals that sharing of tacit knowledge is likely to be vastly increased by intense face-to-face communication. Informal communication provides employees with the ability to share knowledge in a pressure free environment with trust and openness to enable analysis of current problems (Sarker & Joshi, 2005:4).
- *Individual relationships.* They can promote tacit knowledge sharing. Moreover, it is believed that the use of intangible resources such as tacit knowledge is most likely to promote competitiveness in unique ways (Spender, 1996:48). Due to the fact that tacit knowledge is very difficult to share, it is important for firms to embed individual relationships into their social structure in order to promote sharing of knowledge (Lubit 2001:169).
- *Network density.* Social network density combined with intensive interactions and collaborations help in advancing sharing capabilities of tacit knowledge (Droege & Hoobler, as cited in Janus-Hiekkaranta, 2009:53). Firms, thus, need to establish avenues to promote interactions and that is why Droege and Hoobler (cited in Janus-Hiekkaranta, 2009:53) point out that organisations that combine social ties at different levels are most likely to achieve greater sharing of tacit knowledge than organisations that do not optimally combine social ties. The socially dense networks may have high knowledge exchange opportunities as pointed out that “the higher is the network density, the higher the probability of reaching the critical mass” but “the volume of the knowledge network facilitation grows with the increase of the managerial commitment to knowledge sharing schemes” (Janus-Hiekkaranta, 2009:53).

- *Change readiness.* Change is a fact of life that should not be ignored by organisations. According to Wright and Taylor (2003:195), “Change and innovation are closely linked” which implies that when a firm embraces a culture of generating new ideas and innovativeness, it is in position to effect changes to operational practices and behaviours which calls for employees to positively change their attitude and put their theories into practice as a way of sparking creativity and knowledge sharing instead of maintaining the status quo (Janus-Hiekkaranta, 2009:54; Wright & Taylor, 2003:195).

In the same regard, this calls for managers to build a change friendly culture in organisations and keep their staff up-to-date with any information regarding organisational change (Wright & Taylor 2003:195). However, before managers can engage in knowledge sharing about organisational change, it is important to first identify weak areas among staff and allocate resources accordingly in order to promote a friendly environment for knowledge sharing (Siemens, Roth & Balasubramanian, 2008:16).

In addition to the environmental factors that reinforce knowledge sharing in organisations, there are structural and procedural factors that promote knowledge sharing as discussed below:

- *Quality of information.* This is very important in knowledge schemes because information must be correct and up to date to provide better results and reduce the amount of time spent on looking for the correct information thus making it a quick process in sharing it (Wright & Taylor, 2003:196).
- *Strategic connections.* In order for strategies to work and be implemented effectively, they must be communicated at all levels in an organisation to ensure that employees have a clear understanding of their roles and responsibilities which in turn leads to establishment of network connections (Wright & Taylor, 2003:196).
- *Accountability.* This is important for partnerships because there are competitive tendencies in organisations which call for cooperation and collaboration between departments or units and better still, accountability for who is responsible for what has to be made clear (Wright & Taylor, 2003:196).
- *Clarity of responsibility.* Structural and procedural factors can only be met if there is clear division of roles and responsibilities and this is because people need to understand the connection of their work to the organisation (Wright & Taylor, 2003:196). Such clarity of

responsibilities can only be attained if there is a proper and well-designed communication strategy from management to the rest of the employees (Wright & Taylor 2003:196).

- *Rewarding.* A reward system is essential for encouraging and motivating employees to willingly share knowledge with others across the organisation (Laupase, 2003:93). An employee's participation towards sharing of knowledge is shown by the volume contributed and the value of the contribution to the organisation (Cabrera & Cabrera, 2005:5). The rewards given to employees can be in terms of participation in decision-making, job career prospects or skill-based pay or even bonuses.
- *Training.* This increases the quality of knowledge sharing in the sense that employees will be more willing to share knowledge if they have the skills to determine the kind of knowledge needed by the organisation, how to codify it, search for the relevant information, share it and if they know how to effectively use knowledge sharing tools (Cabrera & Cabrera, 2005:5).

#### **2.2.4 An understanding of knowledge retention**

Knowledge retention is an important knowledge management initiative that organisations should put into consideration in order to build an organisational memory as shown in KM literature. According to Levy (2011:582), knowledge retention is an issue of contention and a main challenge in many countries as knowledge becomes a major organisational asset. This is because knowledge should be retained at all costs to avoid loss of valuable knowledge that might maintain organisations in the market place. Organisations that do not embrace knowledge retention as a major KM initiative may end up with losses of valuable knowledge as noted by Probst, Raub and Romhardt (2000:226) that, "Organisations often suffer permanent loss of valuable knowledge through dismissals, redundancies, retirement and death." This same stance is held by Martins and Meyer (2011:77) that, "Knowledge loss has become a critical factor that could make organisations vulnerable in difficult economic times as well as during thriving economic growth periods when competition is rife."

As a result of knowledge loss, it is difficult for organisations to ensure continuity of business if they cannot easily learn from past experiences but continue to reinvent the wheel as already evidenced in some organisations are thriving on new recruitments to gain lost expertise and knowledge (Foster, 2005:Online; Du Plessis, as cited in Martins & Meyer, 2011:78). The issue of knowledge retention

should thus be treated with utmost importance in organisations.

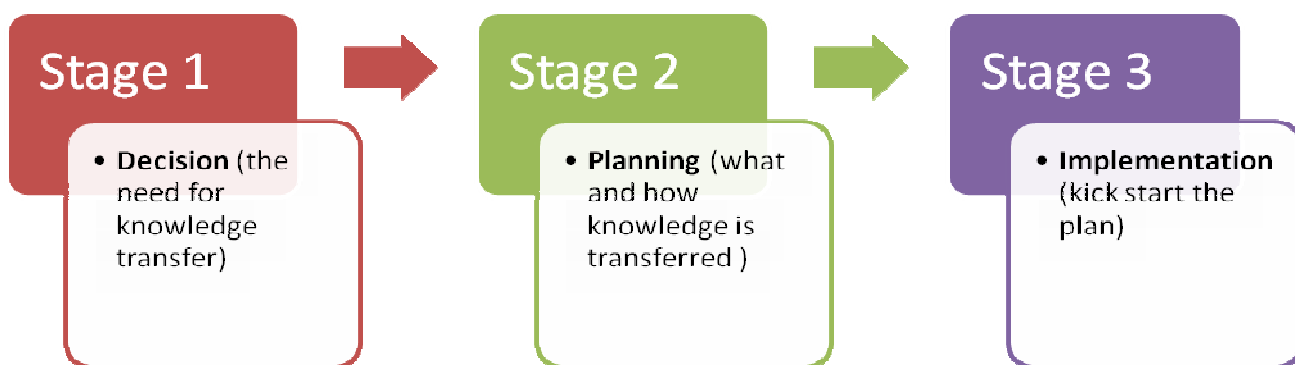
Furthermore, Levy (2011:583) notes that knowledge retention, can also be referred to as knowledge continuity and that it deals with challenges on which classic, well known KM methodologies do not focus. Most KM methodologies are considered to deal with knowledge management subjects rather than focus on specific people (Dalkir, as cited in Levy, 2011:583). Knowledge management solutions should however, focus on creating an environment that promotes knowledge sharing in order to preserve important organisational knowledge. This is in relation to the notion forwarded by Choo (cited in Levy, 2011:583) that, “Long term classic KM solutions focus on an enduring structured environment, where people are encouraged to share their ongoing knowledge, whether in the form of written documents via portals and knowledge bases, or thoughts via forums/discussion groups.”

It is further noted by Levy (2011:583) that knowledge retention should deal with issues relating to experts’ knowledge becoming a valuable organisational asset. This is because when experts are laid off, when they retire, when there is a high staff turnover, or when there is a merger or acquisition, organisations often face a risk of losing a valuable asset called knowledge (Martins & Martins, 2011:49; Martins & Meyer, 2011:77). It is thus vital to clearly understand the effect of knowledge loss in organisations and the importance of retaining it at all costs (Martins & Meyer, 2011:77).

In addition to the above, it should be noted that there are many reasons why people leave organisations but the most important reasons are those that relate to people ceasing to work for the organisation on a permanent basis (Levy, 2011:583). This means that knowledge transfer is an essential activity before people leave in order to have important knowledge retained through an acceptable process. In this regard, Levy (2011:584) identifies a three stage process that organisations can follow in order to retain valuable knowledge. The stages are:

1. *Decision*. This involves deciding whether knowledge should be transferred and at what level knowledge should be transferred. The decision is based on the awareness of the magnitude of knowledge loss if no strategies are put in place for knowledge transfer.
2. *Planning*. This involves defining the knowledge to be transferred vertically as well as how the knowledge should be transferred.
3. *Implementation*. This comes after defining what knowledge to be retained and how it should be transferred. This stage involves the actual implementation of the knowledge transfer plan.

The above stages are further summarised in the figure below:



**Figure 2.6: Three stages for knowledge retention (Source: Adapted from Levy, 2011:584)**

It is important to note that a number of strategies have been proposed by different authors for knowledge retention. The strategies include: communities of practice, job shadowing, storytelling, process documentation, interviews and training, mentoring/coaching, after-action reviews, expert systems, storyboards, job aids, information exchanges, electronic performance support systems (EPSS), best practice studies and meetings (Rothwell, 2004:2; Young, 2006:Online). The above strategies are aimed at improving transfer and retention of both tacit and explicit knowledge in organisations.

In regard to the above, Levy (2011:585) notes that the above strategies are not adequate due to the fact that knowledge has its uniqueness and characteristics. Levy (2011:585) further explains that “communities of practice, for example, are more suitable for groups of experts and for retaining the knowledge of a specific retiring employee.” It is thus important for organisations to apply knowledge retention strategies based on the kind of knowledge in its possession.

### **2.2.5 Challenges in knowledge sharing and retention**

Knowledge sharing and retention are not without challenges in organisations. In this regard, it is believed that knowledge sharing is an extremely complex process and “without the capacity for sharing knowledge, companies can’t access and utilise the specialized resources and capabilities of the various companies involved in the network” (Timonen & Ylitalo, 2007:507).

It is noted that knowledge retention in organisations is a costly venture. This is put forward by Lichtenthaler (2008:155) that quite often, organisations have to pull resources together to internalise and continually evaluate knowledge so that it does not become redundant and get lost thus making it costly to retain knowledge internally.

In relation to the above, it should be noted that if an organisation lacks the ability to create and maintain knowledge sharing networks, there is a likelihood that important organisational knowledge may not be accessed, which implies that an organisation has to rely on external knowledge resources which becomes a financial challenge in the organisation (Lichtenthaler, 2008:148).

Furthermore, due to the common adage that 'knowledge is power', it is believed that employees in organisations fear losing this so called 'power' if they share knowledge with others, something that could weaken their career progression (Bender & Fish, as cited in Peterson, 2012:75; Ramirez, 2007:Online). Bartol and Srivastava (cited in Peterson, 2012:76) note that disclosing of knowledge tends to cause insecurities among employees in organisations. Some employees fear to receive knowledge from others because they do not want to feel dependent on them (Ramirez, 2007: Online).

In terms of IT challenges, it is believed that the ever changing technologies present a big challenge in knowledge sharing and retention in institutions. This is hinted by Peterson (2012:106) that, “The pace at which new technologies are coming into the market, replacing or renewing the old brings new types of issues and challenges.” This means that organisations must constantly be on their 'toes' to keep abreast with the dynamic IT environment.

In addition to the above, it is noted that poor Internet connection in organisations is a great hindrance to knowledge sharing hence slowing down the process of sharing knowledge between experts and collaboration over geographically dispersed locations in a virtual environment (Young, 2010:64).

Jain (2012: Online) notes general challenges that exist in knowledge management in academic libraries and these include: lack of incentives, poor facilitation in terms of IT tools for knowledge management, negative attitude by librarians and lack of knowledge management policies.



## **2.3 Knowledge sharing and retention in academic institutions and libraries**

Knowledge sharing and retention are knowledge management areas that should be given attention in academic libraries which are part of academic institutions. Lee (2005: Online) points out that, “The best knowledge creators are academics. Knowledge creation is best performed by universities.” It has also been noted that academic institutions are big dependents on knowledge resources thus making them active knowledge centres (Oakley, 2002:10; Psarras, 2006:1). Furthermore, “The emerging field of knowledge management offers academic libraries the opportunity to improve effectiveness, both for themselves and their parent institutions” (Townley, 2001:1). Academic institutions should, therefore, be forward-looking and devise means of supporting knowledge sharing and knowledge retention through information technology

In addition, it is noted that academic libraries have over the years generated a lot of knowledge just like academic institutions in general, however, the major problem is that academic libraries and institutions do not consider knowledge as an important organisational resource which is evidenced by the lack of proper knowledge management structures (Townley, 2001:1). More still, it is noted that there is irregularity in knowledge sharing and that librarians quite often lack a systematic way of sharing both explicit and tacit knowledge they have acquired for the benefit of other staff and improving operations in libraries which affects retention of organisational knowledge because when librarians leave the libraries, they tend to leave with some of the acquired knowledge (Onifade, 2010:8). The creation and acquisition of knowledge calls for knowledge sharing to avoid unnecessary loss as noted by Janus-Hiekkaranta, (2009:48) that knowledge that is not shared is useless to organisations.

As already mentioned above in 2.2.3 *An understanding of knowledge retention*, knowledge sharing and retention requires an appropriate environment for efficiency to be achieved. Janus-Hiekkaranta (2009:40) identifies seven elements of a good knowledge sharing environment. These elements include: the organisational corporate strategy, organisational structural capital, intangible resources, information management, learning and knowledge transfer, innovation and cultural complexity. Academic institutions have to put such factors into consideration for effective knowledge sharing. Below is a detailed discussion of knowledge sharing and retention in academic libraries.

### **2.3.1 The importance of knowledge sharing in organisations/academic libraries**

It is important that once knowledge is created/acquired, it is shared so that it can be retained in an organisation. Maponya (2004:16) notes that knowledge sharing is based on experiences that may be

gained internally or externally and that if shared, it saves an organisation a considerable amount of resources as well as avoiding duplication of efforts and facilitating decision-making in organisations. Probst, Raub and Romhardt (2000:164) confirm the importance of knowledge by noting that when knowledge is shared effectively, it ensures use and reuse of knowledge and thus, organisational expertise should be treated with utmost importance and shared.

Knowledge sharing is fundamental in ensuring the effectiveness of libraries and organisations. In this regard, Lee (2005: Online) observes that “Knowledge and experience of library staff are assets of any library and should be valued and shared.” It is, however, important to note that knowledge sharing initiatives are not fully institutionalised in libraries; there is inadequate coordination of knowledge management initiatives to make knowledge available to librarians, which means that knowledge sharing in academic libraries is usually an informal process normally through conversations (Jantz, 2001:35; Maponya, 2004:16; Parirokh, Daneshgar & Fattahi, 2008:119). This is emphasized by Townley (2001:1) that,

“libraries do not consider organisational knowledge as a resource in its own right as they do personnel, collections, or facilities” and that “librarians do not manage knowledge about their organisations as they manage their other resources” which means that “they do not structure their organisations to use organisational knowledge” and “they do not apply organisational knowledge to improve services or the transmission of scholarly information”

In order to deal with the loss of knowledge in libraries, it is important to implement strategies for knowledge sharing and retention. According to Shanhong (2000:Online), libraries should prevent such loss by developing document information resources as well as utilising expert systems in media sharing. It is additionally noted by Wen (2005:Online) that important operational documents should be kept in a central place that is accessed by many people and that an incentive system should be put in place to encourage librarians to share what they know with others. Bartol *et al.* (cited in Onifade, 2010:20) note that organisations have introduced reward systems; for instance, Buckman Laboratories which recognised its top 100 knowledge sharers at an annual conference.

Library management should take responsibility in sensitizing librarians about the importance of knowledge sharing. This same view is held by White (2004: Online) who posits that if library management makes an effort to create awareness about knowledge sharing, staff are likely to engage in the practice and thus improve effectiveness. When knowledge is shared in various parts of an organisation, efficiency is realised (Liao, *et. al.*, 2010:764).

In addition, White (2004: Online) points out the benefits of knowledge sharing in academic libraries as seen below.

- Increased return on investment.
- Better organisational performance.
- More and better understanding of organisation goals and objectives.
- Retention of knowledge of organisation experts.
- Better understanding of organisational change.
- Change of libraries from service oriented institutions to value-oriented institutions.

Effective knowledge management can transform academic libraries into knowledge sharing organisations (Jantz, 2001:34). Knowledge sharing is an important part of knowledge management practices that should be embraced by different organisations including academic libraries to improve job performance and lead to organisational effectiveness as a benefit from what the employees know (Probst, Raub & Romhardt, 2000:64; Widen-Wulf & Soumi, 2007:47).

### **2.3.2 The importance of knowledge retention in organisations**

Different organisations including academic institutions generate massive volumes of knowledge that should be shared and preserved. This is in line with Levy's (2011:583) view that retaining knowledge in an organisation is important as a way of adding value to the organisation. Knowledge retention practices ensure that critical knowledge that is often at risk of being lost is preserved and reused in organisations whereby priorities have to be made regarding the most valuable knowledge that should be retained and making action plans to preserve it (Levy, 2011:583).

In regard to the above, it is highlighted that retaining and maintaining knowledge externally is beneficial to organisations in various ways such as expanding the organisations' knowledge sources to draw knowledge from and building a large knowledge base for absorptive capacity (Lichtenthaler, 2008:149). According to Lichtenthaler (2008:149), absorptive capacity refers to the ability to create network relationships that should be maintained and consists of three elements:

1. Recognising the need to maintain knowledge in inter-organisational relationships and having the ability to do it.

2. The ability to manage relations for knowledge retention.
3. The ability to make the retained knowledge accessible to the organisational employees.

Further still, knowledge retention strategies in organisations often lead to networks which are essential for good working relationships (Lu & Etzkowitz, 2008:7). Lu and Etzkowitz (2008:7) further advocate for formation of interactive networks in academic institutions to enhance knowledge sharing between university staff who may also be the custodians of knowledge. Such networks are important in enhancing the position of a firm and providing a competitive edge by means of new products, processes and services (Fritsch & Slavtchev, 2008:10; Lu & Etzkowitz, 2008:7).

Furthermore, Hughes, O'Regan and Sims (2009:668) recognise the need for social networks which promote knowledge sharing and retention, which facilitate building of relationships and competencies that ensure institutional growth. Spender (1996: Online) notes that knowledge from such networks is the most important organisational knowledge for competitive advantage.

## **2.4 The role of academic libraries in knowledge sharing and retention**

It is important to understand the role that academic libraries play in facilitating knowledge sharing and retention in an academic environment. Lee (2005:Online) notes that, "The new role of libraries in the 21st century needs to be as a learning and knowledge centre for their users as well as the intellectual commons for their respective communities".

In the first instance, an academic library can be viewed as an entity in an academic institution that provides a wide range of information services (Carey, Justh & Williams, 2003: Online). Furthermore, Carey, Justh and Williams (2003: Online) point out that an academic library provides the following:

- A well-organised collection of information materials both in print and other media.
- A group of information professionals to interpret information materials and meet information needs of library patrons.
- Established mechanisms for information delivery to the users of the library.
- Physical facilities to house the collections, staff, and information management systems and programmes.

Academic libraries are considered to be like any other formal organisations that aim at proper utilisation of organisational resources to achieve organisational objectives (Okon, 2005:1). Libraries are explained as organisations that aim at fulfilling the objective of providing information services to library patrons through a coordinated effort of librarians, paraprofessionals and other specialists who work under common objectives for the good of the library (Adeyoyin, 2006:Online; Akobundu, 2008:4). This is elaborated by Panda and Mandal (2006:452) that, “A library professional owes certain obligation to the library clientele, the society, its resources, the library professional organisation, and to himself.”

Important to note, is that academic libraries are considered as learning organisations that facilitate knowledge transfer which ultimately leads to sharing of important organisational knowledge (Jain & Mutula, 2008:10). Giesecke and McNeil (2004:55) define a learning organisation as “An organisation skilled at creating, acquiring and transferring knowledge and at modifying its behaviour to reflect new knowledge and insights” and in a learning organisation, the Internet links people-to-people and people-to-information with intense knowledge sharing and usage capabilities (American Library Association, 2003: Online). Therefore, academic libraries should strive to fulfil their greatest mission which is widely avail knowledge to the users rather than engaging in competition and exclusive internal use of knowledge (Lee, 2005: Online).

Academic libraries are adopting digital scholarship which may include authors’ electronic submissions of articles and publications, peer review, teaching, conducting research, communicating and assessment of academic output in a digital environment (Jain & Mutula, 2008:11). Digital scholarship has been made possible by emerging technologies such as web 2.0 technologies which also promote knowledge sharing (Jain & Mutula, 2008:11).

In addition, digital libraries are considered to be fundamental in making available information accessible for as long as it is needed which in a clear way, promotes knowledge access from digital materials online (Jain & Mutula, 2008:11). It is, thus, important for academic libraries to devise knowledge sharing strategies due to the exponential growth of digital content (Lee, 2005: Online).

In terms of creating and sharing knowledge, Doctor and Ramachandran (2008:42) consider that institutional repositories as part of academic libraries play an important role in creating intellectual content and making available research and scholarly publications to an academic community. According to Rajasheker (2005:64), an institutional repository is a service offered to researchers and scholars by a university for dissemination and preservation of scholarly and research output.

Academic libraries, therefore, play an important role in sharing and retaining explicit knowledge such as scholarly publications in institutional repositories.

Academic libraries play an important role in knowledge sharing through the Online Public Access Catalogue (OPAC) with both internal and external knowledge resources that library staff should ensure are accessible and shared (Lee, 2005: Online). Further still, Lee (2005: Online) proposes that there should be a useful and regular search of sources of knowledge from library OPACs and the Internet by use of hard links.

Libraries, however, ought to look beyond explicit knowledge and extend to devising means of capturing, preserving and sharing tacit knowledge for purposes of retaining important organisational knowledge (Lee, 2005: Online). The library website should be enriched as a portal for preserving and making accessible both explicit and tacit knowledge resources regardless of the format (Lee, 2005: Online).

Networking technologies, digital technologies and telecommunication technologies have given rise to resource sharing and networking in academic libraries (Lee, 2005: Online). Such sharing is usually promoted through library networks. Examples of such library networks include the Online Computer Library Center (OCLC) and Ohio Link which encourage sharing of knowledge from different sources by librarians (Lee, 2005: Online).

More still, it is important for libraries to build knowledge management systems in this knowledge age to facilitate capture, preservation and sharing of knowledge and it is necessary for such systems to be built upon a well-constructed infrastructure of information technology including computers and internet to ensure effective capture, sharing and retention of knowledge (Lee, 2005: Online; Townley, 2001:6).

Lee (2005: Online) further acknowledges that a vast amount of knowledge resides with library staff and users both inside and outside the library which calls for academic libraries to put in place strategies for capturing and sharing such knowledge. It is noted that such expertise is held in vast amounts in universities and research communities and should thus be organised, captured in inventories, indexed and frequently updated which makes it easily retrievable through library online databases in universities and research communities (Lee, 2005:Online). It is the knowledge and experience gained over time by library staff that forms the organisational memory of the library and should, therefore, be treated with utmost importance and shared (Lee, 2005: Online).

In addition, libraries should encourage transfer and sharing of knowledge through a mentoring structure where more experienced staff engage in sharing experiences with new library staff to enable the latter to learn from experts (Lee, 2005: Online; Townley, 2001:6). Further still, informal seminars should be arranged to encourage exchange of ideas between staff as well as special interest groups and chat rooms created via intranets to stimulate sharing of valuable staff experiences which ultimately leads to knowledge retention (Lee, 2005: Online; Townley, 2001:6).

## **2.5 The link between information technology and knowledge management**

Information technology is often linked to knowledge management. Information technology in organisations is described as the acquisition, storage, organisation, and processing data as well as dissemination of processed data by use of a specified technology (Rajaran, 2003:1). It involves email systems, video conferencing media, data warehousing tools, networking tools and Internet systems (Janus-Hiekkaranta, 2009:20).

The use of information technology in knowledge management is not a new concept in knowledge management literature. According to Edwards, Shaw and Collier (2005:113), many authors have written about information technology application in knowledge management. Authors such as Brown (1997), Offsey (1997), Liebowitz (1998), Vriens (1999), Alavi and Leidner (1999), and Dieng *et al.*, (1999) have all attempted to link information technology to knowledge management processes (Edwards, Shaw & Collier, 2005:113). The beginning of the 21<sup>st</sup> century saw a rise in knowledge management literature related to information technology. This is shown by various works of authors such as Earl (2001), Alavi and Leidner (2001), Bhatt (2001), Gottschalk and Khandelwal (2003), Franco and Mariano (2007), Hedgebeth (2007), Revilla, Rodriguez-Prado and Prieto (2009) who have all written about the relationship between information technology and knowledge management in various capacities.

In an attempt to link information technology and knowledge management, Choenni *et al.* (2005:4) identify two approaches to information technology and knowledge management processes: the cognitive approach and community approach; with the former, information technology is used to capture, analyse, organise and share knowledge between individuals, while with the community approach, information technology facilitates communication, social interaction and collaboration between people.

Notably, information technology is closely linked to effective knowledge management in organisations. This mirrors the results from a study by Franco and Mariano (2007:440) that out of the several authors who have established a link between information technology and knowledge management, almost 70% of the publications on knowledge management had a focus on design of information technology. In addition, Hayes and Walsham (2003:54) note that “Information and communication technologies (ICTs) have been closely associated with the development of a great majority of knowledge management initiatives.”

Specifically, information technology is considered as an enabler in knowledge management processes. This is also the same opinion forwarded by Rollett (2003:209) and Gottschalk and Khandelwal (2003:92) that knowledge management should not be driven by technology although information technology plays an important role as an enabler in improving effectiveness and efficiency in knowledge management.

Additionally, information technology for knowledge management is classified by Gottschalk and Khandelwal (2003:92) into four stages as explained below:

- *General IT support.* This is for knowledge workers in organisations. This stage includes word processing, spreadsheets and email systems for end users. Tools for end users include networked PCs on desks within organisations.
- *Information about knowledge sources.* This is where an information system is used to save who knows what (knowledge) without saving what people actually know. An example of this system is the company intranet
- *Information representing knowledge.* This is the third stage that involves a system storing what people know in terms of information. An example of this kind of system is a database
- *Information processing.* This is the fourth stage whereby an information system applies evaluation of situations based on available information/knowledge.

### **2.5.1 Information Technology for knowledge acquisition and storage**

Information technology is considered as an enabler in knowledge acquisition and knowledge storage as shown in literature that technology enables knowledge workers to acquire knowledge through various processes such as externalisation, internalisation and socialisation (Apostolou, Mentzas & Sakkas, as cited in Nemani, 2010: Online). According to Nemani (2010: Online), some of the technologies that enable knowledge acquisition include e-mails, multimedia technology,



brainstorming applications, bulletin boards and discussion boards. Furthermore, the following are technologies that are considered as enablers for knowledge acquisition:

- *Electronic networking*. This may include the Internet, intranet and extranet that enable acquisition and transmission of knowledge from one recipient to another (Nemani, 2010: Online).
- *Groupware*: This is software that is used to support knowledge acquisition through sharing of information by means of collaboration (Nemani, 2010: Online).
- *Intelligent agents*: This is software that transforms significant information into a form that is easy to understand by information seekers (Nemani, 2010: Online).

In regard to knowledge storage, literature reveals that information technology can be applied to store knowledge. For instance, Ackerman and McDonald (cited in Jasimuddin, 2005:40) assert that technologies play a vital role in storing large amounts of knowledge as well as providing fast access to such knowledge. More so, it is noted that most organisational knowledge resides in storage bins which could be technology repositories such as computers and that such knowledge should be easily retrieved by use of technologies (Jasimuddin, 2005:40; Olivera, 2000:814). Common examples of such technologies that facilitate knowledge storage include electronic databases and electronic bulletin boards (Jasimuddin, 2005:40).

Based on the above, it is important for organisations not to ignore the role of information technology in knowledge acquisition and storage because technology acts as an enabler in storing large amounts of knowledge as well as availing knowledge to knowledge seekers.

### **2.5.2 Information Technology for knowledge sharing**

Knowledge sharing and information technology has become a popular field of study today. The role of information technology as an enabler in knowledge sharing activities is indispensable as shown by Shanhong (2000:Online), and, Han and Anantamula (2007:431) that organisations should advocate for application of information technology in knowledge management to expand the possibilities of acquiring and exchanging knowledge in organisations.

More still, it is important for enterprises to keep up with competition by using knowledge to gain a competitive advantage which requires enterprises to widely develop and adopt a knowledge sharing culture (Ray, 2008:156). Unfortunately, organisations hold a vast amount of knowledge which is not shared amongst employees (Townley, 2001:1). One of the solutions that can enable companies to share knowledge effectively in order to outsmart competition is to develop an information

technology solution (Ray, 2008:2).

Furthermore, it is important to note that a number of knowledge sharing technologies exist and mostly rely on the Internet which provides multiple ways of sharing (Saharabudhe, 2001:271). Such strategies have been proposed by various authors and can be applied to knowledge sharing in academic libraries as explained below.

Rollett (2003:211) proposes that communication technologies are efficient in promoting knowledge sharing in organisations because they primarily support knowledge transfer. Communication technologies are categorised to include, “email, electronic discussion forums, instant messaging, chat rooms, and video conferencing” (Rollett, 2003:211). Technologies such as email systems, video conferencing and intranets are considered effective conveyors of knowledge among employees in an organisation (Ou *et al.*, 2010:194).

In addition, another category of knowledge sharing technologies includes collaboration technologies. Collaboration technologies include tools such as virtual whiteboards, shared browsing and brain storming tools (Rollett, 2003:211). Coakes (2006:580) notes that in large organisations, knowledge workers tend to be dispersed across different locations and thus the need to create a virtual working environment that promotes knowledge sharing through collaboration.

More to the above, Penzhorn and Pienaar (2009:1) note that web 2.0 tools are important collaboration tools that promote knowledge sharing in academic libraries while Kaplan and Haenlein (2001:62) consider social media as a technology that enables collaboration and promotes knowledge sharing when people engage in collaborative projects.

Instant messaging (IM) technology is yet another rapidly growing technology that enables real time communication through instant interactions between individuals in a cost effective manner (Ou *et al.*, 2010:193). Although instant messaging technologies are widely used in the social context, they are used to find out what people know and share such knowledge in an informal manner with emphasis that “informal social tools such as IM provide a suitable channel for information sharing in peer-peer, superior-subordinate and cross-location collaboration”. And that it is possible to facilitate and maintain social networks between a team which acts as an appropriate medium of communication for sharing both explicit and tacit knowledge (Ou *et al.*, 2010:195). In addition, socialisation is a great way to share knowledge among individuals (Nonaka *et al.*, 2000:9).

Content creation tools are considered to be effective tools for creating and sharing knowledge. Kaplan and Haenlein (2001:5) point out that content creation tools can be used to promote creation and sharing of media content which is valuable knowledge among users. Rollet (2003:211) notes that such tools include authoring systems and annotation facilities which create and integrate knowledge and even maintain it. Such tools can be used in effective management of knowledge in organisations (Rollett, 2003:211).

Content management systems such as document management and web content management enable integration of document knowledge, linking knowledge, maintaining knowledge, classification, organising and versioning knowledge (Rollett, 2003:211; Saharabudhe, 2001:270). In addition to these functions of content management systems, knowledge transfer is enabled through such systems which promote knowledge sharing in organisations (Rollett, 2003:211).

Adaptation technologies include portals and recommender systems which facilitate knowledge transfer among people (Rollett, 2003:211). These technologies enable customisation and personalisation of knowledge, which can be shared rapidly (Rollett, 2003:211).

E-learning environments are commonly used in academic environments. According to Rollett (2003:211), e-learning environments are based on technologies that enable sharing of knowledge between learners and tutors, among learners themselves or among the tutors themselves. It is thus easy for learners to access knowledge because of the collaborative features such as platforms for group discussions provided by in environments.

Personal knowledge tools include tasks such as bookmarking which enable individuals to organise their content according to their own structures other than following structures established by others of which this content can be shared with other (Rollet, 2003:211). Fourie (2011:388) relates personal information management (PIM) to the above tools and notes that PIM enables individuals to organise and share information. According to Jones (2007: 435), PIM is concerned with controlling personal information in order to make it usable at all times

Artificial intelligence such as expert systems aid in classifying of content, organising knowledge and knowledge transfer in organisations (Rollett, 2003:211). These technologies transfer knowledge rapidly from one person to another thus promoting knowledge sharing (Rollett, 2003:211).

Network technologies are capable of facilitating instant communication between groups of people

and individuals. These technologies combined with instant messaging can greatly enhance knowledge sharing among individuals (Ou *et al.*, 2010:196).

In establishing a link between information technology and knowledge sharing, Gann (2000:207) points out that IT promotes knowledge exchange between project teams and promotes innovation. Gann (2000:207) summarises technologies that can be used to enable knowledge sharing in organisations as follows.

- *Video conferencing*. This allows viewing and participation of users over wide screens as a way of communicating. It gives knowledge sharing a visual appeal over the Internet (Saharabudhe, 2001:275).
- *Groupware such as Lotus Notes*. This supports groups of people working collaboratively on projects across the world, thus, promoting knowledge sharing (Peterson, 2012:115).
- *Intranet*. This is one of the common platforms for knowledge sharing in organisations because they are capable of recording organisational knowledge (Peterson, 2012:110).
- *Electronic mails*: These enable users to compose and transmit messages electronically over the Internet which enables knowledge sharing (Peterson, 2012:113)
- *Databases*. These make it possible for organisations to collect, store and disseminate knowledge such as knowledge of retiring employees (Atwood, 2009:49; Egan, 1998:4).
- Others include portals, electronic bulletin boards, knowledge directories, and intelligent search engines (Peterson, 2012:113).

Based on the presentation above, it is important to note that information and communication technologies play a vital role in knowledge sharing by eliminating limiting factors of time and space thus promoting effectiveness in exchange of ideas (Akamavi & Kimble, 2005:2). It can, thus, be noted that information technology transcends knowledge sharing activities in organisations.

### **2.5.3 Information Technology for knowledge retention**

The advance of technology has changed all aspects of knowledge management including knowledge retention. This stance is in line with Viju's (2011: Online) view that information and communication technologies play a vital role in sharing and reuse of knowledge and retention of important knowledge in an organisation.

Beazley (2003: Online) suggests that for knowledge retention to be successful, there is a need to

define the technology that will enable knowledge transfer. Young (2010:9) identifies technological knowledge management techniques that can be applied in knowledge sharing and retention as shown below.

- *Document libraries leading to a document management system.* These which are considered as repositories that are used to identify and maintain organisational knowledge assets. Important features for these libraries is that they should be easily updated and backed up, should support automatic indexing, provide easy access via a corporate intranet and provide for cross referencing (Young, 2010:41). Such libraries act as knowledge bases in organisations that make knowledge available to employees.
- *Knowledge bases (Wikis, etc.).* These involve the creation of content as new knowledge which is further expanded through discussions and feedback. In addition, a knowledge base allows editing of the expanded knowledge to make it even better knowledge and maintains the history of all the revisions. A knowledge base is an effective tool for sharing knowledge which ensures that knowledge is retained among collaborating employees (Young, 2010:42).
- *Blogs.* These promote retention of important knowledge in organisations. According to Young (2010:50), “A blog is a very simple 'journal style' website that contains a list of entries, usually in reverse chronological order.” Blogs are utilised for mass communication between staff members within an organisation by sharing knowledge through posting and comments of staff in response to posts which can eventually build up into a resourceful and searchable knowledge base (Young, 2010:51).
- *Social network services.* These are online systems that provide access to social networks. The services offered over social networks include finding people with similar interests, putting people in different groups or sub-groups and sharing content such as documents, links to various websites and videos. Through social networks, valuable knowledge is passed on from one individual to another, which ensures knowledge retention in organisations (Young, 2010:53).
- *Voice and voice-over-Internet protocol (VOIP).* This offers the ability to send audio and video signals over the Internet with a connection from one computer to another. VOIP enables instant messaging from one person to another or even between groups of people. Utilising VOIP in organisations makes it a good technique for knowledge exchange and thus retention of knowledge (Young, 2010:55).
- *Building knowledge clusters.* This “is a term given to a group that as a result of coming together in this new way, create, innovate, and disseminate new knowledge.” (Young,

2010:56). This means that individuals, groups and teams connect virtually to come together to communicate, create and share knowledge which is important for retention of knowledge of experts in an organisation (Young, 2010:56).

- *Expert locator*. This is all about finding who knows what in an organisation to avoid reinventing the wheel and duplication of efforts. According to Young (2010:61), an expert locator is an information technology tool that facilitates knowledge retention, building teams by linking people to experts with required knowledge. In other words, the expert locator links people in need of knowledge to people who have the knowledge required, which is a good tool to promote retention of knowledge.
- *Collaborative virtual workspaces*. These enable people to work together regardless of their physical location (Young, 2010:62). It involves document sharing, collaborative editing and video conferencing enabling organisations to keep the best expertise regardless of physical location.

It is important to note that the technologies discussed above facilitate retention of important knowledge in organisations and should thus not be ignored when considering knowledge retention systems.

## **2.6 Information Technology best practices in knowledge sharing and retention in academic institutions and libraries**

Academic institutions and libraries are believed to hold vast volumes of knowledge that should be shared and retained (Lee, 2005: Online). Lee (2005:Online) points out knowledge sharing best practices from OCLC and Ohio Link which have formed networks to promote sharing of knowledge from different sources.

Furthermore, Townley (2001:9) notes that the Oak Ridge Library considers the successful implementation of knowledge sharing projects aimed at promoting organisational wide access to knowledge, collaboration, transparency and integrating tools to facilitate knowledge sharing. One of the projects is the Virtual Proposal Support Centre aimed at promoting knowledge access and collaboration support proposals of interest as shown that, “This centre will improve access to knowledge about grants and proposals of interest to Oak Ridge” through multiple databases, lists of experts and provision of access to other proposals and lessons learned (Townley, 2001:9).

In relation to the above, such projects according to Townley (2001:9) are implemented under key

requirements as shown below:

1. Management of the library should aim at promoting knowledge sharing and collaboration among library staff.
2. Leadership support must exist at all levels in the organisation.
3. A strong collaborative relationship must exist between computing and the library organisation.
4. Development of new skills for librarians is essential in knowledge sharing and retention.
5. Proactive leadership is essential.

In addition, the University of New Mexico Health Sciences Centre has actively engaged in establishment of knowledge sharing and retention initiatives such as creating an environment that is conducive for knowledge creation, use and sharing (Townley, 2001:9). To this effect, a campus wide Advisory Council for Knowledge Management and Information Technology was established with representation from users and staff and this committee was tasked with the mission of promoting knowledge sharing and retention through information technology (Townley, 2001:9).

The IT best practices in knowledge sharing and retention discussed above show that some academic libraries have already embraced information technology in knowledge management initiatives. These libraries can, thus, act as examples to other libraries which wish to apply various technologies in knowledge sharing and retention.

## **2.7 Conclusion**

This chapter has presented a review of literature relating to the role of information technology in knowledge sharing and retention in academic libraries. A research gap has been identified which shows the need to carry out a study assessment of an enabling role of information technology in knowledge sharing and retention in academic libraries. The next chapter is chapter three and it discusses the methodology used in the study.

## CHAPTER THREE: METHODOLOGY

*Do not hover always on the surface of things, nor take up suddenly, with mere appearances; but penetrate into the depth of matters, as far as your time and circumstances allow, especially in those things which relate to your profession.*

*Isaac Watts (1743)*

### 3.1 Introduction

This chapter provides a detailed explanation of the methodology that was used to carry out the study. The methodology focuses on providing a way to systematically solve the research problem under study. Therefore, this discussion covers the research paradigm, research design, research approach and research strategies that were used to guide the study particularly in exploring issues of information technology (IT) application in knowledge sharing and retention at Makerere University Library. In addition, the population of the study, sampling, data collection methods, data collection instruments, data quality control, quality assurance and ethical issues are discussed in detail.

This chapter ends with a conclusion and introduces the next chapter which is Chapter four: Presentation and discussion of findings.

### 3.2 Research paradigm

In the first instance, a paradigm is a wide set of views that are guided by action (Guba, as cited in Pickard, 2007:6; Taylor, Kermode & Roberts, 2007:5). More still, in the definition by Weaver and Olson (2006: 460), it is revealed that a paradigm can affect and guide research as shown in the statement that, “Paradigms are patterns of beliefs and practices that regulate inquiry within a discipline by providing lenses, frames and processes through which investigation is accomplished.” For the purpose of this study, it is important to clearly explain the research paradigm that was adopted.

This study adopted a qualitative research approach which lends itself to the same philosophical foundation as the interpretive paradigm (Weaver & Olson, 2006:36). Furthermore, Weaver and Olson (2006:36) point out that the interpretive paradigm portrays the image that there are many truths and many realities and thus focuses on the holistic approach of the person and the environment. This paradigm was relevant to the study because it was important to understand the



perspectives and experiences of the IT staff and librarians in relation to their work environment.

In addition, Cole (2006:26) notes that in qualitative research, researchers are, “More concerned about uncovering knowledge about how people feel and think in the circumstances in which they find themselves, than making judgements about whether those thoughts and feelings are valid.” This view is reflected in the interpretive paradigm which was adopted for this study.

### **3.3 Research design**

Research design is the set of conditions for collection and analysis of data in an arranged manner with particular relevance to the research purpose in a bid to answer research questions in an economical way (Babbie, 2010:134; Durrheim, 2006:34; Selltiz *et al.*, as cited in Kothari, 2004:31; Stangor, 2011:14). In essence, this means that research design is the blue print for collection, measurement and analysis of data and as such, a framework within which research is conducted.

According to Kothari (2004:32), “Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximum information with minimal expenditure of effort, time and money.” It is thus important to specify the research design that was adopted for this study.

In relation to research design, it is important to note that the study covered aspects of the enabling role of information technology in knowledge sharing and knowledge retention in academic libraries with the case of Makerere University Library. The study was carried out in order to address the main research problem as well as fill the existing gaps in literature regarding the phenomenon under study.

According to Punch (2005:63), research design establishes a connection between the research questions and the data collected. The researcher, therefore, collected data relating to various aspects of IT in knowledge sharing and knowledge retention from both IT staff in the library and librarians at Makerere University Library. Primary data was collected from six IT staff from the library and a sample of six librarians using the interview guide. Secondary data was obtained by use of a document content analysis guide through a comprehensive study of documents as further explained in 3.9.2 *Document content analysis guide*. Data collected was sorted and interpreted in order to derive meaning. A research report was finally compiled with five chapters that is Chapter one: Introduction to the study, Chapter two: Literature review, Chapter three: Methodology, Chapter

four: Presentation and discussion of findings and Chapter five: Summary of findings, conclusions and recommendations.

### **3.4 Research approach**

There are two basic methodological approaches to undertaking research. These methodological approaches to research include quantitative and qualitative approaches (Berg, 2001:54; Kothari, 2004:4). Further still, it is noted that quantitative research is concerned with the measuring of different variables in terms of statistical analysis whereas qualitative is more concerned with defining situations and concepts under study in order to arrive at meaningful and subjective conclusions (Berg, 2001:54; Kothari 2004:4; Stangor, 2011:15).

In addition to the above, data collected by means of the quantitative approach is usually presented in the form of percentages, numbers as well as tables whereas in qualitative research, data is normally presented in form of narrative and descriptive statements. (Babbie, 2010:35; Stangor, 2011:15). It can, therefore, be deducted that a qualitative research approach focuses more on words than numbers whereas quantitative research is more inclined to numbers than words. For purposes of this study, a qualitative research approach was adopted.

According to Oliver (2010:21), the qualitative research approach has the following key features:

- It involves interpreting a particular social occurrence, event, interaction, group or role in order to derive meaning. The study thus aimed at gaining an in-depth understanding of the opinions of IT staff and librarians at Makerere University Library in regard to the enabling role of IT in knowledge sharing and knowledge retention.
- It is investigative in nature whereby the researcher continually interacts and associates with the informant in order to gain understanding of the informant's perspectives and meanings. In this study, the researcher carried out interviews with IT staff in the library and librarians in order to understand their experiences in using IT in knowledge sharing and knowledge retention.
- The data collected is mostly descriptive in nature and the researcher is considered as the main instrument for data collection. This was shown by the fact that the researcher was the interviewer during data collection.

- The focus is on the participants' experience and perceptions whereby tacit knowledge is utilised. This was mirrored in the study whereby the respondents' experience and perceptions were used to inform the study regarding IT application in knowledge sharing and knowledge retention.

### **3.5 Research strategies**

The study used a literature survey as well as a case study design as part of the research strategies as further explained below.

#### **3.5.1 Literature survey**

The study adopted a literature survey in order to explain terms and concepts related to the enabling role of IT in knowledge sharing and knowledge retention in academic libraries. According to Holmes and Gordon (2012:Online), if a literature survey is carried out correctly, “not only will you be aware of the seminal and key work in your area but you will also be confident that your ideas are novel and will contribute to your area of interest.”

The literature surveyed is categorised as secondary data because it is based on secondary and tertiary sources as already presented by other authorities in research articles published in journal articles, books, online sources and other sources.

#### **3.5.2 Case study design**

In addition to a literature survey, case study design was adopted for the empirical component of the study. This is because a case study represents a complete description of a phenomenon within context (Yin, 2009:23). Yin (2009:23) describes case study design as, “An empirical inquiry that investigates a contemporary phenomenon in-depth and within its real life context” while Singh (2006:148) describes a case study as, “A method of exploring and analysing the life of a social unit - be that unit a person, a family, institution, culture group, or even an entire community.” Both descriptions of a case study design above reveal an element of discovering new knowledge about the phenomenon under study.

This entailed getting involved personally, interacting with the people who are charged with the responsibility of IT operations at Makerere University Library as well as librarians in order to seek their views on the different aspects of the research objectives to gain in-depth opinions from the participants.

The above approach, therefore, enabled the researcher to study selected issues in depth, openly and in detail as they identify and attempt to understand the categories of information that emerge from the data (Blanche, Durrheim & Painter, 2006:37).

### **3.6 Population of the study**

A number of authors define a study population in a similar way. A general description of a study population is that it is a larger pool of elements that are included in the study from which the researcher draws conclusions relevant to the study (Blanche, Durrheim & Painter, 2006:35; Babbie, 2007:111; David & Sutton, 2004:149; Stangor, 2011:110).

In addition, it is important to carry out a careful selection of the study population in any research (Powell, 1997:66). Therefore, the population for this study consisted of technical staff and librarians at Makerere University Library. In particular, IT staff at Makerere University Library were involved in the study. In addition to IT staff, a sample of librarians was determined and involved in the study. The IT staff were chosen for the study because they operate the IT systems in the library and, therefore, had influential opinions for the study. Other librarians were involved in the study because it was important to compare the views of the librarians and those of the IT staff in regard to IT application in knowledge sharing and retention at Makerere University Library.

### **3.7 Sampling**

According to Punch (205:101), it is not always possible to study everyone or everything. This, thus, means that determining of a sample size is important in research projects. In relation to sample size, it is important to note that Makerere University Library has a known population of 51 professional staff and out of those, only six have a direct responsibility with IT systems in the library and were thus involved in the study. In addition to the above, a sample of six librarians was chosen to take part in the study.

In view of the above, sampling is important to allow a directed study. It is observed that sampling is the selection of research participants from a larger population by applying subjective judgement or inference (Babbie, 2007:184; Blanche, Durrheim & Painter, 2006:49). The researcher, therefore,

employed the purposive sampling technique for the study in order to allow the selection of interviewees whose knowledge or experiences permit an understanding of the phenomenon in question.

Purposive sampling was relevant to the study because it provided direction for the researcher in data collection whereby respondents were chosen based on their knowledge and experiences. Further still, Patton (cited in Pickard, 2007: 64) notes that, “The logic of purposeful sampling lies in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purposes of the research.” A sample of six librarians who are considered to be 'information-rich' were thus selected for inclusion in the study.

### **3.8 Data collection methods**

The researcher adopted a combination of data collection methods; in particular, interview and document content analysis methods were used. The data collection methods are explained below.

#### **3.8.1 Interview method**

The interview method was used in the study. According to Pickard (2007:172), “Interviews can be used for reconstruction of events, descriptions and feelings about current events and predictions for future development” while Lindolf and Taylor (2002:173) point out that, “Interviews are particularly well suited to understanding the social actor’s experience, knowledge and world views.” The statements above indicate that by using the interview method, the researcher can obtain an in-depth understanding of experiences, perceptions and opinions of respondents.

The interview method involved face-to-face conversations between the researcher and six IT staff in the library as well as a selected sample of six librarians. Interviewing respondents was a good method to obtain reliable and valid measures in the form of verbal responses from more than one respondent. In addition, the interview method was used because it allowed the researcher to elicit information from various respondents based on their knowledge, ability and experience.

### **3.8.1.1 Advantages of the interview method**

Interviewing various respondents is advantageous in a number of ways as explained below:

1. It allows comparison of views and permits flexibility to include important information that may arise from interviews (Dawson, 2002:17).
2. Furthermore, the interview method can be used if the researcher is “... interested in understanding the perceptions of participants or learning how participants come to attach certain meanings to phenomena or events, interviewing provides a useful means of access” (Taylor & Bogdan, 1998:98). Using an interview is, therefore, fundamental in providing an in-depth understanding of the subjects under study.
3. It can be used by the researcher to obtain information that may not be obtained from other methods such as observation and questionnaires because the face-to-face interaction between the interviewer and the interviewee allows for probing questions that may lead to a whole new area of information (Creswell, 2009:179).

### **3.8.1.2 Disadvantages of the interview method**

However, it is important to note that the interview method has some disadvantages such as the following:

1. Difficulty in coding responses whereby indirect information may be provided by the interviewees (Creswell, 2009:179; Tayie 2005:99).
2. It is time consuming and quite often involves issues of confidentiality (Tayie, 2005:99).
3. The place of the interview may be designated rather than a natural field and thus may not reflect the actual phenomenon under study (Creswell, 2009:179).
4. The respondents involved may not all be articulate (Creswell, 2009:179). This may thus lead to misunderstanding the information revealed.

### **3.8.2 Document content analysis method**

Document content analysis is a method that involves analysing documents relating to the phenomenon under study. Krippendorp (2004:18) defines content analysis as, “A research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” while Cohen, Manion and Morrison (2007:475) refer to content analysis as, “The process of summarising and reporting written data – the main contents of data and their messages.” This method was, therefore, used to get information from documents that guided the study as elaborated in 3.9.2 *Document content analysis guide*.

### **3.8.2.1 Advantages of document content analysis**

As part of qualitative information gathering, the document content analysis method has a number of advantages as pointed out by Creswell (2009:179) in the explanation below.

1. This method can be used at any time of convenience to the researcher because documents are considered as an unobtrusive source of information.
2. The information got from this method is written evidence and thus saves the time of the researcher in transcribing.

### **3.8.2.2 Disadvantages of the document content analysis method**

Creswell (2009:179) identifies some of the disadvantages of using the document content analysis method and these include the following:

1. The information may be in hard to find places and thus present difficulties to the researcher in terms of access.
2. The information may also not be available to the public because of confidentiality issues observed by organisations.
3. The documents may not be authentic, may be incomplete and inaccurate which may not fully represent the phenomenon under study.

## **3.9 Data collection instruments**

The researcher used the following instruments while employing the above methods.

### **3.9.1 Interview guide**

An interview guide is a list of relevant questions, themes and areas to be followed during collection of data (Berg, 2001:74). It is thus important to construct interview guides that are relevant to the study in terms of eliciting in-depth information. Furthermore, Yin (2009:9) notes that in constructing an interview guide in a case study approach, there is need to ensure that in-depth data will be collected from the interviewees free from bias.

The nature of questions used in the interview guide was open-ended to allow collection of detailed information relevant to the study. Open-ended questions enabled the researcher to have flexibility in data collection where one question led formulation of the next question. This is in line with Pickard's (2007:178) view that, "There is no reason to stick to a rigid set of questions if this will not achieve your research goals. You can learn from one interview before you move onto the next." Open-ended questions are thus framed in a way that allows solicitation of both facts and opinions

from respondents and can be changed to allow collection of data required.

### **3.9.2 Document content analysis guide**

A document content analysis guide was used to obtain information relevant to the study as per the literature survey. This instrument was used in order to keep the researcher focused on the area of study. It was important to use the content analysis guide because it ensured that the knowledge of the phenomenon under study was obtained to inform the study. As such, the researcher analysed relevant content found in documents in Makerere University Library such as the Makerere University Library Strategic Plan 2007-2017, training and instructional manuals, and library section reports. The document content analysis guide was thus used to gather relevant data from the documents above.

### **3.10 Application of questions to the study**

The study was based on the main research problem and sub-problems. Therefore, the questions asked in the interviews aimed at addressing research sub-problems and ultimately the main research problem. The main research problem that guided the study is: the relationship between information technology competency and knowledge sharing in academic libraries for purposes of retaining key organisational knowledge while the research sub-problems included the following: relationship between information technology and proper acquisition and storage of knowledge; promoting a knowledge sharing culture using information technology; building information technology based knowledge sharing and retention systems; as well as addressing information technology challenges in knowledge sharing and retention in academic libraries.

The first research sub-problem was addressed by a number of questions under Section B in both interviews for the IT staff in the library and the librarians. Section B of both interviews is titled 'the relationship between information technology and proper acquisition and storage of knowledge' and is composed of eight questions. It is important to note that all the eight questions for IT staff were related to the questions for librarians for purposes of making a comparison between the views of the two categories of staff.

The second research sub-problem was addressed in Section C of the interviews for both IT staff and librarians at Makerere University Library. Section C is titled 'promoting a knowledge sharing culture using information technology' and was composed of eight related questions for both the IT staff and librarians.



The third research sub-problem was answered by a number of questions under Section D of the interviews for both IT staff and librarians. The section is titled 'building IT-based knowledge sharing and retention systems. Section D was made up of nine related questions for both the IT staff and librarians at Makerere University Library.

The fourth research sub-problem was addressed in Section E of the interviews for IT staff and librarians known as 'addressing IT challenges in knowledge sharing and retention'. The questions asked in both interviews under Section E were related and were five in total. The application of questions to the main research problem and subsequent research sub-problems is summarised in the table below:

**Table 3.1: The application of questions to the study**

<b>Research sub-problem</b>	<b>Section that addressed sub-problems (Interview for IT staff)</b>	<b>Section that addressed sub-problems (Interview for librarians)</b>
<b>Sub-problem 1:</b> The relationship between information technology and proper acquisition and storage of knowledge	Section B: The relationship between information technology and proper acquisition and storage of knowledge	Section B: The relationship between information technology and proper acquisition and storage of knowledge
<b>Sub-problem 2:</b> Promoting a knowledge sharing culture using information technology	Section C: Promoting a knowledge sharing culture using information technology	Section C: Promoting a knowledge sharing culture using information technology
<b>Sub-problem 3:</b> Building IT based knowledge sharing and retention systems	Section D: Building IT based knowledge sharing and retention systems	Section D: Building IT based knowledge sharing and retention systems
<b>Sub-problem 4:</b> Addressing IT challenges in knowledge sharing and retention	Section E: Addressing IT challenges in knowledge sharing and retention	Section E: Addressing IT challenges in knowledge sharing and retention

### **3.11 Data analysis and presentation**

It is noted that in qualitative research, analysing data is one of the most challenging stages in the research process (Yin, 2009:32). According to Powell (2003:2), the first step in qualitative analysis of data in case studies is sorting, understanding and gaining a focus of the data under analysis. In addition, Yin (2009:32) suggests that when analysing data in case studies, there should be use of categorisation, tabulation and testing qualitative evidence to address the problem identified in the study.

In addition the above, Leedy and Ormrod (2005:136) suggest that there should be a logical arrangement of data according to the themes of the case under study and analysis of data according to the themes. Leedy and Ormrod (2005:136) point out that data from various sources must be integrated into meaningful results and thus, “Ultimately, the researcher must look for convergence (triangulation) of the data: many separate pieces of information must all point to the same conclusion.”

Based on the above, during data collection and after the data had been collected, the researcher edited the data accordingly, a process known as cleaning of data. This was necessary because if no such measures were taken, mistakes could ruin the entire research project. The researcher further used qualitative content analysis to analyse, describe and interpret data based on the research main problem and research sub problems. According to Powell (2003:2), quantitative content analysis is done in order to have a meaningful interpretation and understanding of the data.

Data was then presented in the form of quotations, as well as tabulations and according to Creswell (2009:218), “this involves creating codes and themes qualitatively, and then counting the number of times they occur in the text data. ” Microsoft Excel was used to present data in form of tabulations.

Furthermore, meanings were derived and explained, interpretations were made as per the research objectives and discussion of findings was done upon which conclusions and recommendations were made for the study.

### **3.12 Quality assurance**

It is important to ensure quality and validity of data so that the result can be trusted. According to

Pickard (2007:139), it is important to have trustworthiness of data collected especially if the researcher is in a familiar environment because, “This is what gives the investigation credibility in terms of problem solving and solution testing”. In this regard, the researcher was in a familiar environment that is Makerere University and particularly Makerere University Library where data was collected. It was thus easy to ensure that data was collected from the relevant and trusted sources.

According to Herr and Anderson (cited in Pickard, 2007:139), validity and trustworthiness of data can be classified as follows:

1. *Democratic validity*. This is the degree to which the researcher and the librarians in Makerere University Library were involved. This was done by ensuring that there was adequate collaboration between the researcher and the librarians before, during and after data collection.
2. *Outcome validity*. This is the extent to which the outcome solves the problem that is identified in the study. The researcher ensured that appropriate questions relating to the research objectives were asked to ensure that the main research problem was answered.
3. *Process validity*. This is the degree to which the process relates to the outcome. This was reflected in data collected, which was used as a basis upon which recommendations were made for application of IT in knowledge sharing and retention in academic libraries.
4. *Catalytic validity*. This is the extent to which the study has an impact on the researcher and the respondents in terms of understanding the situation and changing it. This was ensured by formulating questions relating to challenges in IT application in knowledge sharing and retention as well as proposing solutions to overcome such challenges.

In addition to the above, pilot testing of instruments was carried out in order to make necessary adjustments for reliability of data to be collected. According to Berg (2001:80), pilot testing ensures that data collection tools are adequate enough to allow valid and reliable results. More still, it is important to test instruments by administering them to experts in the field as well as to the actual respondents (Berg, 2001:80; Durrheim, 2006:94). The pilot testing was, therefore, carried out with knowledge management experts at the East African School of Library and Information Sciences and secondly with the IT staff in the library as well as a selected sample of librarians.

Further still, by using different methods, the researcher ensured that all the data collected and used in the study was accurate and up-to-date. Validity and reliability of data is part of data quality control. The researcher constantly checked and verified questions and any other collected information during the process of data collection to ensure completeness and accuracy of data.

### **3.13 Ethical issues**

Ethical issues are matters concerning morality and wrong or right while conducting research (Babbie, 2010:64). It is noted that ethical issues cover various aspects of informed consent of participation, confidentiality, protection from harm, anonymity and privacy while conducting research (Babbie, 2010: 64; Bless, Higson-Smith & Kagee, 2006:143; David & Sutton, 2004:136; Neuman, 2006:129).

In order to observe ethical considerations, the researcher abided by the research and ethical guidelines set by the University of Pretoria by taking the following steps.

- The researcher obtained clearance from the Faculty Committee for Research Ethics and Integrity, under the Faculty of Engineering, Built Environment and Information Technology, University of Pretoria in order to carry out the study at Makerere University Library.
- The respondents in the library were informed about their participation in the study in advance for the case of interviews so as to avoid ill preparations during data collection. To this effect, the respondents were asked to sign a consent form to show consent to participate in the study. As such, the form contained contact information of the researcher in case further information was required by the respondents in regard to the study.
- The researcher considered ethical issues of confidentiality of all the information from the respondents, protection of the respondents' identities, exercise of freedom of thought, intellectual honesty and maintaining of independence from possible attempts to bias and ensuring security of data during and after completion of research. The security of data was ensured in such a way that all the information gathered from the interview sessions was captured in a Microsoft Word document and the original copy kept under lock and key.

### **3.14 Conclusion**

The discussion above presents the methodology that was adopted in the study with elaborate evidence in literature justifying the approaches that were adopted by the researcher. Chapter 3 discusses the research paradigm; research design; research approach; research strategy; population,

sampling; data collection methods; data collection instruments; application of questions to the study; data analysis and presentation; quality control and ethical issues.

Chapter four presents and discusses empirical findings as obtained by the methods discussed in chapter three above.

## CHAPTER FOUR: PRESENTATION AND DISCUSSION OF FINDINGS

*If there were only one truth, you couldn't  
paint a hundred canvases on the same theme.*

Pablo Picasso (1966)

### 4.1 Introduction

Chapter three discusses the methodology adopted for the study. This chapter presents and discusses the key findings of the empirical study. It is important to note that this chapter is twofold and integrates two parts. The first part consists of the presentation of findings obtained from the research methods employed in the study while the second part is comprised of the discussion of findings in relation to related literature in chapter two. The format followed for presentation and discussion of findings is in such a way that findings are presented and discussed under each major theme in a logical way.

The findings of the study were obtained by use of a qualitative research approach with research methods deemed appropriate for qualitative studies. The research methods employed in the study included interviews and document content analysis. The findings are presented and discussed in accordance to the research sub-problems identified in chapter one under *section 1.3 Problem statement*.

The interviews covered a total number of twelve respondents of whom six respondents were information technology (IT) staff while six respondents were librarians at Makerere University Library with a purpose of comparing the opinions of the two categories of staff. The documents covered under document content analysis included the Makerere University Library Strategic Plan 2007-2017, staff instructional manuals, and section reports.

As already noted above, the findings are logically presented and discussed according to specific themes. The themes under which the findings are presented and discussed include the following: description of respondents of the study; information technology for knowledge acquisition and storage at Makerere University Library; information technology and a knowledge sharing culture; information technology based knowledge sharing and retention systems; and proposed solutions to address information technology challenges in knowledge sharing and retention. It is important to note that under each of the above mentioned themes, there are a number of sub-themes that present the findings from the different questions asked in the interviews. More still, findings from the two

categories of staff are presented and discussed together if similar while findings that differ are presented and discussed separately under category one (C.1) and category two (C.2) to represent IT staff and librarians respectively. In a bid to represent direct views of the two categories of respondents, different colours are used. Colour blue is used to represent direct quotes from IT staff while magenta is used to represent direct quotes from librarians. The key findings of the study are presented and discussed below.

## **4.2 Description of the respondents**

The importance of this section was to provide an understanding of the characteristics of the respondents. This in turn provided an overall picture of the kind of respondents that took part and their different roles in the study. As already mentioned in 4.1 above, the total number of respondents involved in the study was twelve. Of the twelve respondents, six were IT staff at Makerere University Library while six were librarians in the same library. The description of respondents is divided into two sub-sections that is the response rate of the respondents and the characteristics of the respondents as explained below.

### **4.2.1 Response rate of the respondents**

Response rate refers to the percentage of all the respondents who successfully take part in the study as expected by the researcher (Stangor, 2011:109). In this regard, the expected number of respondents for the interviews was twelve that is six IT staff and six librarians at Makerere University Library. All twelve respondents participated in the study which implies that there was a 100% response rate.

The response rate above was very pleasing because all the respondents who took part in the study work from 08:00am to 05:00pm which means it was difficult to get time to interview all of them. However, the researcher ensured that interview questions were sent prior to the interviews, appointments were scheduled in advance and time keeping was observed. This approach helped to overcome problems of low response rates which according to Punch (2005:101) can be a troubling and disappointing experience for the researcher.

### **4.2.2 Characteristics of respondents**

Interviews first sought demographic information so as to better understand the respondents involved in the study. The purpose of including this section was to establish the position of the respondents in providing valid data for the study as well as to attain important information for follow up of respondents to clarify on certain issues after the interviews. There were two categories of staff that

were involved in the study; that is, the IT staff and librarians at Makerere University Library. The categories of respondents are further discussed in terms of ranks, sections of operation in the library and period of service under C.1 and C.2 to represent IT staff and librarians respectively as shown below.

### **Position at the library**

The reason for asking both the IT staff and librarians about their positions at the library was to establish whether the respondents were in the right position to understand issues of application of IT in knowledge sharing and retention.

#### **C.1:**

In terms of positions of IT staff, one of the staff was identified as the team leader of the Information and Communication Technology (ICT) department while all the other IT staff were identified as IT specialists for library services. This means that the IT staff provide IT support services under the leadership of the team leader of ICT department. Having a team leader is perhaps important for the department for easy coordination of IT activities.

#### **C.2**

Librarians that took part in the study were found to be in different positions at the library. Of the six librarians, two of the librarians were in the position of 'librarian I' while four of the librarians were in the position of 'librarian II'. Librarians at Makerere University Library are ranked according to their level of education which means that librarians with a bachelor's degree are in the position of 'academic librarian II' while those with a master's degree, are in the position of 'academic librarian I' (Makerere University Library Strategic Plan, 2007:4).

The positions of IT staff shown above do not show much about how they qualify to be in such positions while the positions of the librarians show that Makerere University Library employs qualified librarians who may be in the right position to adopt IT applications in library services. This is shown by the fact that all staff involved in the interviews had attained at least a bachelors' degree while others had master's degrees.

### **Section of operation at the library**

The researcher asked the IT staff and librarians about their sections of operation in order to establish whether their work relates to the application of IT in knowledge sharing and retention. Further still, this information was important for following up respondents for clarification on matters relevant to



the study

### C.1

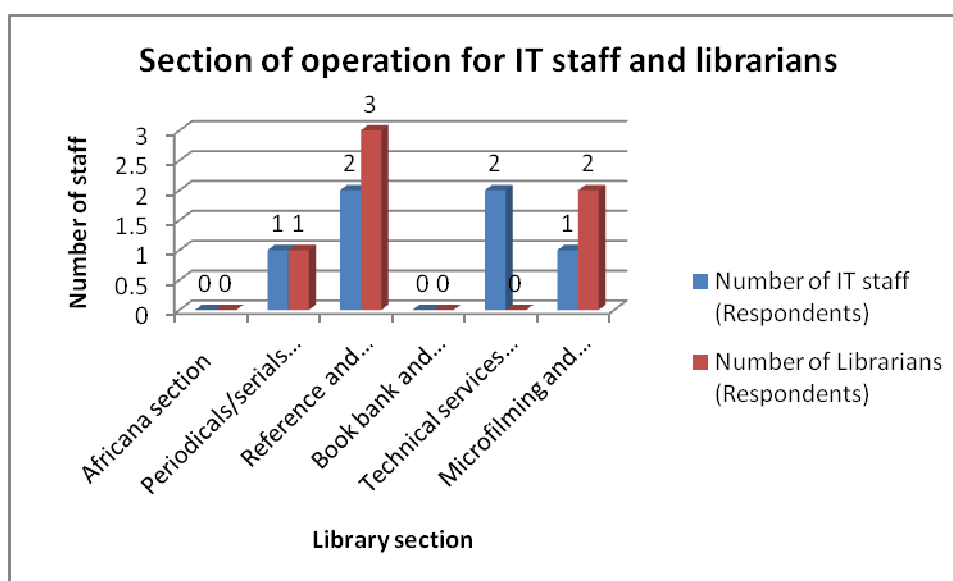
In regard to the sections at the library, the study revealed that the six IT staff were deployed by the Information and Communication Technology department in the library to work in different sections of the library. The sections of the library include Africana section; periodicals/serials section; reference and circulation section; book bank and bindery section; technical services section; and microfilming and digitization section (Makerere University Library, 2013:Online).

The findings showed that the six IT staff were deployed in four departments; that is, two IT staff in the technical services section, two IT staff in the reference and circulation section, one IT staff in the microfilming and digitization section and one IT staff in periodicals/serials section.

### C.2

Six librarians were purposively selected to take part in the study based on their knowledge and experience in working at the library. According to Pickard (2007:64), purposive sampling provides direction for collecting rich and in depth data. Two of the librarians chosen worked in the microfilming and digitization section while one librarian worked in the periodicals/serial section and the other three librarians worked in the reference and circulation section.

The findings above about the section of operation for both the IT staff and librarians is summarised in the figure below.



**Figure 4.1: Section of operation for IT staff and librarians at Makerere University Library**  
(Source: Field Data, 2013).

From the findings above about the sections of the library, the placement of IT staff shows good representation of major sections in the library in which knowledge sharing and retention is applicable. Furthermore, there is an implication that IT services are not limited to the Information and Communication Technology department where IT staff operate in isolation of other sections but rather IT staff provide services and operate in different sections of the library. In essence, librarians work with the IT specialists to complete their tasks that require IT services. This, therefore, means that IT is part and parcel of library services at Makerere University Library.

### Period of service

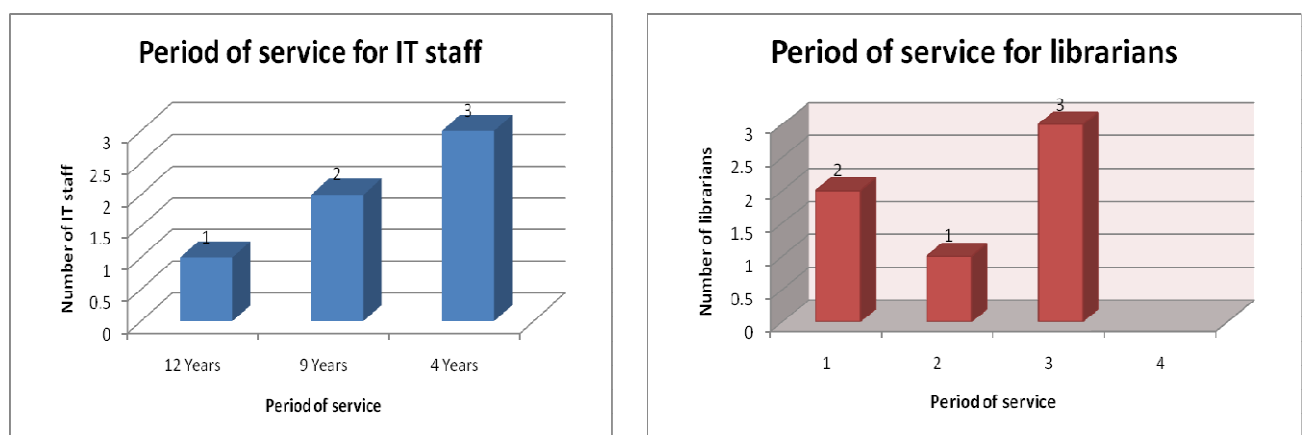
It was necessary to find out the period of service of the IT staff in order to establish and compare their years of experience which, therefore, impacts on their credibility to avail information relevant to the study.

#### C.1

The findings showed that only one IT staff had served for a period of 12 years, two of the IT staff had served for nine years while three of the IT staff had served for a period of four years. The implication of such findings is that it was evident that half of the IT staff had been in service for a period of not more than five years which means that half of the staff have limited experience in working at Makerere University Library.

#### C.2

The study revealed that two of the librarians had served in the library for a period of fifteen years. One librarian had served for twelve years while three librarians had served in the library for a period of nine years. The period of service for both IT staff and librarians is summarised in the figure below.



**Figure 4.2: Period of service for IT staff and librarians (Source: Field data, 2013)**

In comparison of the period of service by IT staff and librarians, it can be said that the librarians had been in service for longer periods than IT staff *as shown in figure 4.2 Period of service for IT staff and librarians* above. This could be attributed to the fact that significant IT developments have only taken place at the library in the past five years (Makerere University Library, 2013: Online). This could mean that more librarians have witnessed the introduction of IT services at the library for more years than the IT staff.

### **4.3 Information technology for knowledge acquisition and storage at Makerere University Library**

This section is in line with the first research sub-problem and was included in the interview in order to provide essential information in regard to knowledge acquisition and storage. Various questions were asked under this section which were answered as presented and discussed in the sub-themes below.

#### **4.3.1 Description of information technologies at Makerere University Library**

Interviews conducted for both IT staff and librarians at Makerere University Library showed that the library has in place various information technologies ranging from hardware, software and networks as explained below.

##### **Hardware**

Hardware is considered to comprise of all the physical components that work together in computer systems. They include all devices used for input, output as well as storage. In relation to the study, the respondents revealed that input devices included digital cameras, scanners, recorders, mice, keyboards and microphones while output devices included printers, liquid crystal display projectors (LCD), audio readers, card readers and circulation machines and speakers whereas storage devices included computer hard disks, flash disks, compact discs, external portable hard discs and DVDs.

##### **Software**

In regard to software, it was revealed that there was a variety of software that is used in the library for various reasons. The software in the library can be categorised into operating software and application software. The operating software that was revealed in the study included Windows operating systems (XP, Windows 7 and Windows 8), Linux operating system as well as Mac OS. The application software used in the library was found to include Microsoft Office (2003, 2007 and 2010) as well as other specialised software including the following.

- *Virtua integrated library system.* This was adopted in 2004 to integrate all the major library functions including acquisitions management; patron/client registration and management of patron records; circulation management; library cataloguing and information processing; Online Public Access Catalogue; special collections management; and importation of bibliographic data from other libraries. This information was obtained from the interviews carried out as well as document content analysis through analysis of the Makerere University Library Strategic Plan 2007-2017. According to the strategic plan, all Virtua modules are fully operational.
- *Dspace software for the institutional repository.* This is known as Uganda Scholarly Digital Library at Makerere University and is mainly used to collect all the scientific research and scholarly publications by academic staff at Makerere University Library. The institutional repository software Dspace is an open source software that was adopted in 2005 by Makerere University Library to preserve scholarly output of the academic staff (Digitisation and Microfilming Section Report, 2008:2).
- *Jaws software.* This is used to support audio reading for people with disabilities especially blind library users. The software helps to read out aloud information on the computer screen and provides special navigation features.
- *Audacity recording software.* This is used in the library to record and edit live audio files, change the speed of recordings, convert analogue recordings into digital as well as record from various channels simultaneously.
- *Other specialised software.* These include Database for African Theses and Dissertations (DATAD) which is used to manage dissertations in the library; card master used as a master record for the card catalogue and can print out catalogue cards; Google drive and Dropbox for cloud storage.

## Networks

From the interviews conducted for both IT staff and librarians as well as document content analysis, it was revealed that Makerere University Library operates Local Area Networks (LANs) to support its IT services. However, connection to the Internet is through the Campus Wide Network which is run by the Directorate of Information and Communication Technology (DICTs). In addition, Makerere University Library runs wireless networks shown by the provision of various wireless hotspots to its wireless users.

The information technologies (hardware, software and networks) in Makerere University Library

described above are summarised in table 4.1 below:

**Table 4.2: Information technologies at Makerere University Library**

Information technologies by category	Examples of categories of information technologies
Hardware (input, output and storage devices)	<p><b>Input devices:</b> digital cameras, scanners, recorders, mice, keyboards and microphones.</p> <p><b>Output devices:</b> printers, liquid crystal display projectors (LCD), audio readers, card readers and circulation machines and speakers.</p> <p><b>Storage devices:</b> computer hard disks, flash disks, compact discs, external portable hard discs and DVDs.</p>
Software (operating, application and special software)	Windows operating system (XP, Windows 7 and Windows 8), Linux, Mac OS, Microsoft Office (2003, 2007, and 2010), Virtua ILS for the library system, Dspace for the institutional repository, Jaws software for the blind, Audacity recording software, DATAD for managing dissertations, card master for printing catalogue cards, Google Drive, Dropbox, Content Management Software for managing the library website.
Networks	Local Area Networks, Wi-Fi and Campus Wide Network

**Source: Field Data (2013)**

Although table 4.1 above shows that there are various information technologies at Makerere University Library, the study revealed that of the above technologies, only a few devices were available for use for library staff. According to the IT Section Report (2012), it was noted that there are eight printers, one tablet, six laptops, 41 desktop computers, six scanners, three projectors, and one still camera as shown in table 4.2 below.

**Table 4.3: Information technology devices for library staff at Makerere University Library**

Information technology devices for library staff	Number of devices available for use for library staff
Printers	8
Tablets	1
Laptops	6
Desktop computers	41
Scanners	6
Projectors	3
Still cameras	1

**Source: ICT Section Report (2012)**

It is noted from the findings above about information technologies used in the library that some of the technologies described above fit within a description of information technologies as provided in literature under 2.5 *The link between information technology and knowledge management* by Janus-Hiekkaranta (2009:20) who notes that information technology can include email systems, video conferencing media, data warehousing tools, networking tools and Internet systems. It is obvious from the above, that information technology must involve hardware tools, software and networks if email systems, video conferencing, data warehousing and networking are to take place.

Furthermore, the findings above show that Makerere University Library has adopted important technologies that are required for survival in the digital and knowledge age. For purposes of this study, it can be said that studying these information technologies was relevant for the sake of linking information technology to knowledge sharing and retention in academic libraries as part of knowledge management initiatives. Linking information technologies to knowledge management initiatives is not new in literature as mirrored by Edwards, Shaw and Collier (2005:113) under 2.5 *The link between information technology and knowledge management* that many authors have written about the application of information technologies in knowledge management.

However, as shown in table 4.2 *Information technology devices for library staff at Makerere University Library* above, the IT devices deployed for library staff are inadequate in relation to the number of professional library staff who are 51 in total as revealed in 3.7 *Sampling*. This shows that not all professional library staff can access IT equipment whenever there is need to utilise the equipment.

### 4.3.2 Application of IT tools in knowledge storage

Both the IT staff and librarians at Makerere University Library were asked questions about which IT tools are applied in knowledge storage and how the IT tools are applied in storing knowledge. The findings from the interviews are presented and discussed below according to the two categories of respondents.

#### C.1

From the interviews, category one which represents IT staff in the library, revealed that the IT tools that are utilised in knowledge storage include the institutional repository, databases, backup servers in remote locations as well as cloud storage tools such as Google Drive and Dropbox. It was however, noted by the IT staff that the institutional repository is the major IT tool used for storage of knowledge at Makerere University Library. This was well expressed by some of the interviewees as reflected in their responses below,

“When it comes to knowledge storage, the institutional repository takes first place because it directly stores new knowledge discovered by academic staff in the form of research output” (Interviewee #1).

“From my understanding of what knowledge is, I think that the main tool we have in Makerere University Library for knowledge storage is the institutional repository because it preserves knowledge of researchers (Interviewee #4).

“Although there are other tools that are used to store knowledge in the library, I still think that the institutional repository is more utilised in storing institutional knowledge” (Interviewee #6).

In terms of how IT tools are applied in knowledge storage, it was revealed that for the institutional repository, knowledge can be stored through self-archiving as well as through having institutional repository staff who scan materials or collect knowledge resources from staff, get metadata and upload the knowledge resources into the repository using Dspace software as already mentioned above in *4.3.1 Description of information technologies at Makerere University Library*. Other tools such as cloud storage tools are used for knowledge storage after downloading software such as Google drive and Dropbox and installing them on library computers. Files can then be uploaded, created and stored on cloud spaces. Databases are used to store electronic resources which the library staff can access through the use of passwords. Backup servers in remote locations were noted as part of the tools that are applied in knowledge storage where large amounts of knowledge resources are backed up on library servers remotely.

## C.2

Similarly, interviews with librarians revealed that the library mainly uses the institutional repository to store institutional knowledge. This was evidenced by responses from librarians such as.

“The only IT tool for knowledge storage in the library that I can think of, is the institutional repository that keeps publications of staff” (Interviewee #3).

“It is not like there are no other IT tools, but the institutional repository is the main tool that stores knowledge in the library” (Interviewee # 6).

Other IT tools used for knowledge storage in the library included databases and computer hard disks. Apart from IT tools, there are other storage mechanisms that were identified by librarians such as storing documented knowledge in files and boxes in the archives. In terms of how the IT tools are applied in knowledge storage, the librarians explained that the institutional repository and databases are used in a similar way as revealed by the IT staff under C.1 above. Computer hard disks are used by individual librarians to store personal information which they may consider as knowledge.

From the above views on the application of IT tools in knowledge storage, it can be said that both the IT staff and librarians agreed that the institutional repository was the major IT tool used for knowledge storage. The act of an institutional repository preserving knowledge has been documented in literature as shown in *2.4 The role of academic libraries in knowledge sharing and retention* by Rajasheker (2005:64) who points out that an institutional repository plays an important role in the dissemination and preservation of scholarly and research output by university researchers.

Other IT tools revealed were computer hard disks, servers in remote locations, and cloud storage tools such as Google Drive and Dropbox. Databases were also revealed as IT tools that are important for knowledge storage. This importance is acknowledged in literature under *2.5.1 information technology for knowledge acquisition and storage* 2.5.2 where Jasimuddin (2005:40) notes that electronic databases are among the common examples of technologies for knowledge storage and in *2.5.2 Information technology for knowledge sharing* where Egan (1998:4) and Atwood (2009:49) point out that databases make it possible for organisations to collect, store and disseminate knowledge such as knowledge of retiring employees.



More still, it is of concern to note that none of the librarians mentioned cloud storage tools like Google applications and Dropbox which were mentioned only by the IT staff. This could imply that not many librarians utilise cloud services much as they offer free storage space and other sharing capabilities.

#### **4.3.3 Challenges faced in the application of IT in knowledge acquisition and storage**

The two categories of respondents were interviewed about the challenges faced in the application of IT in knowledge acquisition and storage. It should be noted that the challenges revealed by both categories of staff did not differ. Below are the challenges discussed in general.

Firstly, the IT staff and librarians provided information about the challenges of IT application in knowledge acquisition and these included the following:

- *Lack of IT equipment.* There is a limitation in terms of deployment of IT equipment especially hardware as evidenced in *4.3.1 Description of information technologies at Makerere University Library* above. This is shown by the fact that some staff share computing facilities to carry out their work; this slows down the knowledge acquisition process with the use of IT.
- *Lack of skilled staff.* It was revealed that the number of IT competent staff in the library is still low because according to the respondents, it is believed that most staff possess basic IT skills and quite often do not look beyond such skills for opportunities to improve. This affects the application of IT in knowledge acquisition simply because the staff can hardly operate the IT infrastructure in place.
- *Limited bandwidth.* This was identified by both categories of staff as a limitation faced in the application of IT in knowledge acquisition. Some of the interviewees responded as follows,  
“Makerere University Library being in a third world country like Uganda, still faces great challenges with bandwidth which affects knowledge acquisition especially through slow speeds” (Interviewee #1).  
“since the library relies on the limited bandwidth provided by DICTs, it becomes very challenging and affects IT-related services including knowledge acquisition” (Interviewee #1).
- *Old equipment.* This is not up-to-date or compatible with new software. This is a challenge because it affects purchase of knowledge acquisition software and limits the acquisition of knowledge resources using IT.

- *Negative attitude of staff towards use of IT.* It was noted that there is a challenge of staff shunning new IT systems in the library regardless of the functions they are meant to perform. This is the same challenge faced in the application of IT in knowledge acquisition at the library. Some of the respondents said the following about this challenge, “The best library systems are not those that perform wonders but those that are accepted by the users” (Interviewee #3).  
“Librarians often attach monetary value to the use of IT. If the technology does not provide any financial benefits for them, they tend to shun it which is the same problem that applies to knowledge acquisition” (Interviewee #6).
- *Limited financial resources to fund IT for acquisition of knowledge resources.* It was discovered that the library budgets are always cut from the central administration which generally affects acquisition of knowledge resources through IT. Two of the respondents elaborated on the same matter as follows, “The library prioritises IT services but the only limitation is that we operate under a limited budget which in turn limits the application of IT in knowledge acquisition” (Interviewee #5).  
“The library always budgets huge sums of money for its IT infrastructure but the disappointment always sets in when the budget is cut by the central finance committee” (Interviewee #4).
- *Limited participation of staff in the use of IT in knowledge acquisition.* It was noted that although the library acquires knowledge resources electronically, only a few staff participate in acquiring it which means that most of the staff do not even know how knowledge is practically acquired.

The challenges above limit the application of IT in knowledge acquisition at Makerere University Library. Literature in 2.2.2 *An understanding of knowledge management processes* reveals that knowledge acquisition should successfully be done if there is application of information technology (Carlsson, as cited in Peterson, 2012:106) but unfortunately, for Makerere University Library, there are many challenges that make application of IT in knowledge acquisition less successful.

In terms of challenges faced in the application of IT in knowledge storage, the following challenges were identified by IT staff and librarians.

- *Limited storage space.* This was a challenge identified by both IT staff and librarians where the respondents revealed that storage space, especially server space was a challenge. The main worry was what will happen in the future when knowledge resources increase.

- *Poor connectivity.* This challenge was identified by both categories of staff for application of IT in knowledge acquisition as well as storage. Storage of knowledge especially in databases and institutional repository is affected by poor connectivity. The respondents revealed that the process of storing knowledge is delayed due to slow connectivity.
- *Migration challenges.* This challenge was identified specifically for Dspace which is currently the software used for the institutional repository. One of the respondents was quoted saying that,  
 “We have already faced a major challenge of losing some of the stored knowledge resources in the institutional repository when we tried to migrate automatically from the older version of Dspace 1.7 to the latest version 3.2”(Interviewee #1).
- *Copyright issues for the case of the institutional repository.* This challenge was specifically identified for the institutional repository. This was mainly because when submitting knowledge resources to the repository, permissions of works especially the scanned works may not be easy to obtain.
- *Limited submissions of knowledge resources to IT tools/systems.* Such IT tools/systems include the institutional repository. It was revealed that the utilisation of the institutional repository is still low because the academic staff in the library and the university at large have not fully accepted the repository as a tool for preserving their knowledge resources. One of the interviewees responded as follows,  
 “It seems that the institutional repository has not been well publicised to all staff because submission of knowledge resources is still on a low end” (Interviewee #5).

It should be noted that storage of knowledge is a vital step in retaining important organisational knowledge. The above challenges are an indication that Makerere University Library should devise practical means to address the challenges in order to have proper application of IT in knowledge storage. The suggested means of addressing the above challenges are discussed in sub-section 4.3.5 *Addressing challenges of application of IT in knowledge acquisition and storage* below.

#### **4.3.4 Addressing challenges of application of IT in knowledge acquisition and storage**

Sub-section 4.3.4 *Challenges faced in the application of IT in knowledge acquisition and storage* above presented and discussed the challenges in relation to the application of IT in knowledge acquisition and storage, this sub-section covers suggested solutions by respondents to the above-mentioned challenges as presented and discussed below.

For challenges relating to application of IT in knowledge acquisition, the following were recommended as strategies to address them.

- Increase funding towards the purchase of IT equipment so avoid shortage of hardware and software as well as to replace old equipment that is no longer compatible with newer technologies
- Staff training should be carried out to equip staff with the necessary skills for acquiring knowledge using IT. It was thus suggested that training should be done on the use of knowledge acquisition software.
- It was suggested that the library should recruit competent IT staff to increase on the staffing levels of both the IT staff and librarians who can competently handle IT services.
- Increase bandwidth for the library to solve the problem of slow speeds. One of the interviewees suggested that,

“The library should liaise with the Directorate of Information and Communication Technologies (DICTs) to allocate more bandwidth to the library” (Interviewee #3).

It was noted that increase in bandwidth would improve the application of IT in knowledge acquisition.

As already noted above in *4.3.4 Challenges faced in the application of IT in knowledge*, it is documented in literature under sub-section 2.2.2 that knowledge acquisition should be successfully done if there is application of information technology (Carlsson, as cited in Peterson, 2012:106). This means that for successful application of IT in knowledge acquisition at Makerere University Library, the strategies proposed above to address the existing challenges in the application of IT in knowledge acquisition ought be implemented.

For challenges relating to application of IT in knowledge storage, the following solutions were suggested by both IT staff and librarians.

- It was suggested that the software should be updated whenever the need arises: this was suggested to avoid running outdated technologies. The respondents further suggested that the library should bring in specific experts on various systems when migrating from one version to another.
- It was deemed important for DICTs to try as much as possible to allocate more server space to the library specifically designed for storage of knowledge resources.
- It was thought necessary by the respondents that the library should widely publicise the institutional repository among staff since it was considered the major IT tool for storing

knowledge resources.

- It was suggested that there should be multiple ways of storing knowledge in the library other than the institutional repository.

From the strategies above, it is important to note that even though challenges exist in the application of IT in knowledge storage at Makerere University Library, there is a wide range of solutions that would improve the application of IT in knowledge storage if well implemented.

#### **4.4 Information technology and a knowledge sharing culture**

This section was included in the study in order to answer the second sub-problem of the study. The section was thus meant to establish what knowledge is shared in the library; how and when it is shared; the conditions and incentives for sharing knowledge; and how IT can generally promote a knowledge sharing culture in the library. Both IT staff and librarians were asked questions relating to knowledge sharing and the findings from both categories of respondents are presented and discussed below.

##### **4.4.1 The kind of knowledge shared at Makerere University Library**

As already mentioned above in *4.4 Information technology and a knowledge sharing culture*, the IT staff and librarians were asked what knowledge they shared and below are the findings presented under C.1 and C.2 to represent IT staff and librarians respectively:

##### **C.1**

From the interviews, the IT staff revealed that they share different knowledge among themselves including the following:

- *Practice-based knowledge.* The IT staff revealed that this includes knowledge about daily operations in IT work such as troubleshooting of IT systems; discovery of new and changing technologies.
- *Project experience.* It was revealed that the library runs many IT projects specially handled by the Information and Communication Technology Section which include software implementation, system design and training projects. Examples of such projects include setting up of the Makerere Library information system (MakLib), and the Database for African Theses and Dissertations (DATAD). It was noted that knowledge from such projects is shared among IT staff.

- *Business processes.* It was found that knowledge on how IT systems work, installation of systems; latest versions of IT systems, systems security, how to handle systems breakdown, how to deal with network failure, migrating from one system to another is often shared in the library.

## C.2

The interviews with librarians revealed that there is a lot of knowledge shared in the library including the following.

- *Practice-based knowledge.* This includes knowledge on the use of IT equipment in the library which is shared through work orientation, knowledge on customer care issues, knowledge on problems faced in daily routine work such as circulation of materials.
- *Project experience.* It was found that librarians share knowledge about their experiences on various library projects. Some of the projects that were mentioned included microfilming and digitisation, collection development, setting up of research commons, electronic document delivery service and library automation.
- *Business processes.* The knowledge that is shared that relates to business processes was found to include the workflow of the institutional repository, knowledge on how Virtua integrated library system operates, knowledge on how to process books in the library (cataloguing and classification) and knowledge on the digitisation process.
- Furthermore, the study revealed that librarians share knowledge from training, workshops, seminars and conferences attended; written knowledge on new library policies; knowledge on strategic decisions that affect the library; knowledge on procurement of library tools; and knowledge on important communication from superiors.

In regard to the knowledge above that is shared by both IT staff and librarians, it should be noted that both categories of staff share practice-based knowledge, project experiences and knowledge on business processes. In addition, the librarians revealed that they share written knowledge on policies, important decisions, the procurement of books and important communication from superiors. It is, therefore, important to note that this knowledge is formal and informal in nature.

Further still, all the knowledge above can be categorised as explicit and tacit knowledge depending on its nature. Explicit knowledge is considered to be found in codified form or in written documents such as the written policies and decisions as well as business processes mentioned above. This is in concert with the notion forwarded by Smith (2001:315) and Hislop (2009:23) in literature under

2.2.1 *An understanding of knowledge* that explicit knowledge is considered as codifiable, impersonal, context independent, easy to share and can be stored in databases, repositories and shared in print and electronic resources. Tacit knowledge on the other hand may include practice-based knowledge and project experiences because this kind of knowledge is individual based. This tallies with literature in 2.2.1 *An understanding of knowledge* that reveals that tacit knowledge is personal, context specific and subjective in nature (Hislop, 2009:23). It is thus imperative to note that both explicit and tacit knowledge are shared at Makerere University Library.

#### 4.4.2 Ways of sharing knowledge at Makerere University Library

The IT staff and librarians were asked about how they share the knowledge mentioned above and the findings from both categories of respondents showed similar ways of sharing knowledge. Below is a presentation and discussion of what was revealed from the respondents:

- *Conversations.* Both the IT staff and librarians revealed that most of the knowledge especially practice-based knowledge and project experiences is shared informally through conversations or one on-one-talks. This method of sharing knowledge is done through oral communication or informally through electronic mails.
- *Written documents.* The study showed that IT staff and librarians share knowledge through written documents such as written reports, training manuals, work orientation guides/manuals, and Microsoft Powerpoint presentations.
- *Instant messaging (IM).* This was also revealed among both IT staff and librarians as a way of sharing knowledge with colleagues in the library.

The methods above of sharing knowledge in the library show that library staff utilise both formal and informal means of sharing knowledge. This is in line with what is documented in literature under 2.2.3 *An understanding of knowledge sharing* that knowledge sharing can either be informal or formal in nature (Janus-Hiekkaranta, 2009:48). Conversations and written documents are common methods of sharing knowledge in the library. Instant messaging was identified as an additional method of sharing knowledge. It is indeed true that IM can foster knowledge sharing as proven in literature under 2.5.2 *Information technology for knowledge sharing* that instant messaging enables real time communication through instant interactions among individuals in a cost effective manner (Ou *et al.*, 2010:193).

Furthermore, both categories of respondents were asked how the experts pass on vital information to other staff and both categories responded similarly as seen below:

- *Training.* The interviews with both the IT staff and librarians showed that the experts normally pass on vital knowledge through training whereby training sessions are arranged so that experts train other people in various fields. For instance, two of the respondents said this,  
 “In the IT department, different staff have different skills which makes them experts in various fields. If someone for instance, masters any software that is relevant to the library, a training and sensitisation workshop must be arranged to train other colleagues about the new software” (Interviewee #3).  
 “we do have a skills gap in the Digitisation unit but one important thing is that the expert in the unit always arranges for us training sessions where we learn from his expertise” (Interviewee #2).
- *Dissemination seminars.* The study showed that experts who attend special training either abroad or within the region pass on vital knowledge acquired through dissemination seminars arranged by the library. One of the interviewees responded as follows,  
 “When I attended the recent IFLA conference in Singapore, I came back and disseminated what I presented at the conference through a dissemination seminar” (interviewee #3).
- *Workshops and conferences.* These were said to be common at the library where internal workshops are arranged to create awareness of IT systems and projects in the library as well as organisation of local conferences where knowledgeable library staff present what they know to other staff and the public at large.
- *Mentoring.* The respondents revealed that senior staff are often given young librarians to mentor thus passing on vital knowledge to them. The senior staff do this through working hand-in-hand with young librarians and giving them instructions where possible. Furthermore, the senior staff are encouraged to coauthor articles with the junior staff.
- *Through written reports.* It was noted from the interviews that the experts are required to write reports which are sometimes turned into training manuals for other staff to access for important knowledge.

The methods above through which experts pass on vital knowledge to other staff are very important for retention of important knowledge at Makerere University Library. Some of the above-mentioned methods are reflected in literature as ways through which knowledge can be shared. For instance, literature under 2.5.2 *Information technology for knowledge sharing* shows that mentoring is a good way of sharing information where more experienced staff engage in sharing experiences with new library staff to enable new library staff learn from experts (Lee, 2005: Online; Townley, 2001:6).



#### **4.4.3 When knowledge is shared at Makerere University Library**

The two categories of respondents were asked when they share knowledge in order to establish the necessity of knowledge sharing. Both the IT staff and librarians' responses in this regard did not differ as shown in the presentation and discussion below.

Both the IT staff and librarians indicated that they share knowledge during professional meetings, when the need arises, when instructed to do so, during presentations, and informally on a daily basis through conversations.

The findings above about when knowledge is shared indicate that there is no formal reporting for knowledge sharing at Makerere University Library which means that a knowledge sharing routine is not easily predictable. This means that it is not easy to determine whether knowledge is shared daily, weekly, monthly, quarterly or annually.

#### **4.4.4 The conditions and incentives for knowledge sharing**

When asked about the conditions that facilitate knowledge sharing in the library, both the IT staff and librarians revealed the following.

- A conducive work environment was noted as one of the conditions that facilitates knowledge sharing among both IT staff and librarians at Makerere University Library. One of the interviewees responded that,  
“A conducive work environment where openness is encouraged and the line-managers/supervisors are team oriented is one of the conditions that facilitates knowledge sharing” (Interviewee #1).
- Library policy on dissemination of knowledge and best practices for all library staff who have travelled and attended workshops and conferences. This is one of the conditions that facilitates knowledge sharing and retention in the library.
- Interactive networks in the library such as virtual groups on Facebook and staff blogs were found to facilitate knowledge sharing to some level. However, these networks are not fully utilised by staff to share knowledge maximally.

From the findings above on conditions that facilitate knowledge sharing in the library, it can be noted that it is important to ensure that the environment in which library staff operate is conducive enough, policies should be in favour of activities that support knowledge sharing and knowledge sharing platforms such as interactive networks should be emphasised. The latter is in line with what

is documented in literature under 2.3.2 *The importance of knowledge retention in organisations* where Lu and Etzkowitz (2008:7) advocate for the formation of interactive networks in academic institutions to enhance knowledge sharing among university staff who may also be the custodians of knowledge.

In response to the question about which incentives are in the library for knowledge sharing, the IT staff and librarians revealed similar answers as presented and discussed below:

- *Recognition.* Both the IT staff and librarians agreed that recognition is one of the methods that is used to motivate staff to share what they know as expressed below,  
“Although knowledge sharing is not a formally recognised activity in the library, management always recognises anyone who shares knowledge attained from seminars or training” (Interviewee #4).  
“Quite often, during major meetings, the university librarian reads out the names of individuals who disseminate new knowledge attained from training” (Interviewee #3).
- *Training.* The study showed that as a way of motivating library staff, the library sends them for training so as to acquire new knowledge which they must then pass on to other staff upon completion of the training. It was for instance revealed that,  
“In 2009, two of the librarians were sent to Oslo Norway to attend a [sic] training in Learning and Teaching in the Digital Age (LATINA) which equipped them with knowledge and skills to become trainers themselves in the library” (Interviewee #1).
- *Reward system.* It was found that rewards in the form of bonuses are common incentives for knowledge sharing in the library but they are given in the form of facilitation allowances to library staff who present their knowledge through dissemination seminars.
- *Promotion.* It was revealed that promotion for library staff only happens if they publish widely and disseminate a lot of findings to other staff.

It is, however, important to note that much as the respondents mentioned the incentives above, they also mentioned that those incentives are indirectly linked to knowledge sharing because there is no formal knowledge management in the library. This means that the above incentives promote knowledge sharing in an indirect manner. It is none-the-less important to note that motivating library staff to share what they know is an important way of retaining vital knowledge in the library. Some incentives such as rewards are common in the library and this is a similar situation in other organisations as noted by Bartol *et al.* (cited in Onifade, 2010:20) in literature under 2.3.1 *The importance of knowledge sharing in organisations/academic libraries* that organisations have introduced reward systems for instance Buckman Laboratories which recognised its top 100

knowledge sharers at an annual conference. This is because a reward system is essential for encouraging and motivating employees to willingly share knowledge with others across the organisation (Laupase, 2003:93) as written under 2.2.3 *An understanding of knowledge sharing*.

#### **4.4.5 The use of IT to promote a knowledge sharing culture**

Information technology is fundamental in various aspects of library activities. For this reason, both the IT staff and librarians at Makerere University Library were asked how IT can be used to promote a knowledge sharing culture. The two categories of respondents revealed similar findings which are presented and discussed below,

- *Social media*. This was identified by both IT staff and librarians as one of the ways through which IT was being used to promote a knowledge sharing culture in the library. It was noted that Facebook, Twitter and blogs were the most common channels through which knowledge is shared in the library by writing posts, commenting and tagging friends.
- *Intranet*. Both the IT staff and librarians agreed that the intranet is used to share knowledge whereby staff presentations in the form of Microsoft PowerPoint are uploaded and shared thus promoting a knowledge sharing culture.
- *Library website*. It was noted by both IT staff and librarians that the library website in a way promotes a knowledge sharing culture through its interactive nature. On the website, staff chat and discuss issues concerning the library profession.
- *Institutional repository*. As already noted above in 4.3.2 *Application of IT tools in knowledge storage*, the institutional repository preserves all the scholarly and research output by the academic staff of Makerere University. The two categories of respondents revealed that by uploading knowledge resources into the institutional repository which can be accessed by staff, the repository indirectly promotes a knowledge sharing culture.

From the above, it is necessary to note that a knowledge sharing culture is key to retaining important knowledge even when staff leave the library. Application of the above IT tools is, therefore, fundamental in ensuring that employees develop a culture for sharing knowledge. It should be noted that similar tools are noted in literature under 2.5.2 *Information technology for knowledge sharing*. An example of such tools is the intranet which is considered as a common platform for knowledge sharing in organisations because they are capable of recording organisational knowledge (Peterson, 2012:110). Another IT tool revealed above that is shared in literature under 2.5.2 *Information technology for knowledge sharing*, is the library website which should be enriched as a portal for preserving and making accessible both explicit and tacit

knowledge resources regardless of the format (Lee, 2005:Online).

#### **4.5 Information technology based knowledge sharing and retention systems**

This section was included in the interviews in order to answer the third research sub-problem. The section, therefore, aimed at establishing which IT systems/tools are applied in knowledge sharing and retention at Makerere University Library, the extent to which the systems are utilised in knowledge sharing and retention, the IT skills and training required by librarians, the challenges in knowledge sharing and retention as well as the IT support services in the library. The two categories of respondents in some instances revealed similar answers while in other instances the answers differed. All the similar answers by IT staff and librarians are presented and discussed together while the different answers are presented and discussed separately under C.1 and C.2 to represent IT staff and librarians respectively as shown below.

##### **4.5.1 IT systems/tools applied in knowledge sharing and retention at the library**

The following were revealed as the IT systems/tools applied in knowledge sharing and retention at the library.

- *Virtua ILS*. This was identified by both IT staff and librarians as a knowledge sharing tool through its OPAC. This is because the OPAC provides important information that leads to access to knowledge resources. One of the respondents said that,  
“It should, however, be noted that Virtua ILS is a library system that integrates major library functions with minimum application to knowledge management” (Interviewee #6).
- *Intranet*. Both the IT staff and librarians revealed the intranet as an IT tool that is applied in knowledge sharing and retention. As already mentioned in 4.4.5 *The use of IT to promote a knowledge sharing culture* above, the intranet is used in knowledge sharing whereby staff presentations in the form of Microsoft Powerpoint are uploaded and kept for use by others.
- *Electronic mail*. According to the IT staff and librarians, electronic mail is used to share and keep important information by library staff. This is done through communication via the Internet.
- *Institutional repository*. All the respondents revealed that the institutional repository was one of the IT systems that is applied in knowledge sharing and retention in the library. As already mentioned above in 4.3.2 *Application of IT tools in knowledge storage*, the institutional repository preserves all the scholarly and research output by the academic staff of Makerere University which in a way allows knowledge sharing as well as knowledge

retention through the preservation aspect.

- *Google applications and Dropbox*: Both the IT staff and librarians revealed that Google applications and Dropbox were some of the tools that are used to share and retain knowledge. It was noted that these tools are used at a personal level where individual knowledge is shared and kept for re use.
- *Social media tools*. Among the social media tools, Facebook and Twitter were identified for knowledge sharing but not necessarily knowledge retention while blogs and wikis were identified as tools that are used for both knowledge sharing and retention. This is because blogs and wikis are more content oriented; such content can be shared and retained unlike with Facebook and Twitter.

The above-mentioned IT systems/tools that are applied in knowledge sharing and retention in the library are the common tools that are used in other organisations to pass on vital knowledge for retention purposes. As already noted above in *4.5.2 Utilisation of IT systems in knowledge sharing and retention at Makerere University Library*, Makerere University Library does not have formal procedures for knowledge management. This, therefore, means that all these tools are applied indirectly to knowledge sharing and retention. In addition, it should be noted that although Virtua ILS is mentioned as one of the tools that are applied in knowledge sharing and retention at Makerere University Library, its application to knowledge management is minimal. This is because the system is designed to integrate library functions which relate to managing information.

Furthermore, some of the above-mentioned tools are confirmed as knowledge sharing tools by literature under *2.5.2 Information technology for knowledge sharing*. Literature confirms that electronic mails enable users to compose and transmit messages electronically over the Internet which enables knowledge sharing (Peterson, 2012:113). It is further confirmed in literature under *2.5.2 Information technology for knowledge sharing* that social media as a technology enables collaboration and promotes knowledge sharing when people engage in collaborative projects (Kaplan & Haenlein, 2001:62). Blogs are also tools that are used for both knowledge sharing and retention. This is in line with literature under *2.5.3 Information technology for knowledge retention* that blogs are utilised for mass communication between staff members within an organisation by sharing knowledge through posts and staff's comments in response to the posts which can eventually build up into a resourceful and searchable knowledge base (Young, 2010:51).

#### **4.5.2 Utilisation of IT systems in knowledge sharing and retention at Makerere University Library**

The respondents were asked the extent to which IT systems are utilised in knowledge sharing and retention; both the IT staff and librarians revealed that there is little utilisation of IT systems in knowledge sharing and retention in the library because most of the staff do not know about the concept knowledge management. Some of the responses from interviewees are shown below,

“I would say that knowledge sharing and retention by use of IT systems in this library, is a work in progress. There is still a lot of be desired in the utilisation of IT systems in knowledge sharing and retention”

“I think it’s to a small extent because there is no formal knowledge sharing and retention done in the library. What I mean is that IT systems are hardly used to capture what people know and later on preserve it”

The revelation above shows that it is true that IT systems exist in the library but their usage in knowledge sharing and retention is low. The systems mentioned above in *4.5.1 IT systems/tools applied in knowledge sharing and retention in the library* are, therefore, in place but with limited application in passing on vital knowledge for purposes of retaining it. The concepts of knowledge sharing and retention are new to library staff which means they simply utilise the systems to share information at an individual level. This, therefore, calls for library management to consider implementing a stronghold in applying IT systems in knowledge sharing and retention to avoid loss of important information.

#### **4.5.3 IT skills and training required by librarians at Makerere University Library**

Both IT staff and librarians were asked questions regarding IT skills and training required by librarians. The findings from the interviews are presented and discussed under C.1 and C.2 to show what was revealed by IT staff and librarians respectively.

##### **C.1**

In the interviews, IT staff were asked what skills they think librarians require to utilise IT systems in knowledge sharing and retention. In response to this question, the IT staff revealed that librarians require basic programming skills, data curation skills, database management skills, and end user management skills.

When asked what form of training is recommended for librarians, the IT staff revealed the following:

- *Training in networking technologies.* It was established from the IT staff that although librarians are not IT experts, there is a need to learn about networking technologies to be able to establish connectivity problems in the library which may hinder the use of IT systems.
- *Training in the use of cloud services.* The IT staff noted that librarians hardly use free cloud services which could be attributed to lack of awareness of the existence of such services. The IT staff all agreed that such training was necessary for librarians because storage by use of cloud services has become a trend in organisations including Makerere University and can save employees from losing valuable information and knowledge. .
- *Other forms of training.* These included training IT staff how to use library software such as Virtua ILS, Dspace as well as content management so as to be able to manage knowledge on the web.

## C.2

Librarians were asked what skills they apply in the utilisation of IT systems in the library and they mentioned the following: data entry skills, searching skills, navigation skills, end user management skills and system browsing skills.

Furthermore, when asked what form of training they require to enable them to effectively utilise library systems, the librarians revealed that they required more training in data entry, searching, system navigation, saving and retrieving data, user profile access, database management and special training in automation of libraries.

From the presentation of findings about the IT skills and training required by librarians at Makerere University Library discussed above, it is noted that some of the suggestions by IT staff differ from those revealed by the librarians. What the IT staff revealed as skills required by librarians to utilise the existing IT systems differs from what the librarians revealed as skills they apply in the utilisation of the systems apart from one type of skill (end user management). This, therefore, shows that there is a skills gap among the librarians as pointed out by the IT staff.

Furthermore, in terms of the training recommended for librarians, it was noted that apart from a few suggestions that were similar, the rest of the suggestions by the IT staff were different from what the librarians proposed. This shows that there is need for librarians at Makerere University to take on IT

training as a priority in order to fit in this dynamic IT environment.

#### 4.5.4 Challenges in knowledge sharing and retention

The IT staff were asked about the challenges that systems present in knowledge sharing and retention while the librarians were asked about the challenges that they experience in using IT systems in knowledge sharing and retention in the library. Both categories of respondents were further asked about any other challenges faced in regard to knowledge sharing and retention. The findings in relation to the above are presented and discussed under C.1 and C.2 to represent the views of IT staff and librarians respectively as seen below.

##### C.1

The IT staff were asked what systems present challenges in knowledge sharing and retention in the library and they revealed the following:

- *The institutional repository.* As already noted above in 4.3.4 *Challenges faced in the application of IT in knowledge acquisition and storage*, there is a challenge of migration from older versions to the latest versions of the institutional repository software known as Dspace. In this regard, the IT staff identified the institutional repository as one of the systems that presents challenges in knowledge sharing and retention because there is often loss of knowledge resources during the migration process.
- *Virtua ILS.* This was identified as a system that provides minimum knowledge sharing and retention features. It was noted that this system is not ideal for knowledge sharing and retention thus the need to have in place a knowledge management system.

##### C.2

In regard to what challenges librarians experience when using IT systems in knowledge sharing and retention in the library, the following was revealed by librarians:

- Systems are often inaccessible due to network hindrances/low bandwidth: one of the interviewees was quoted saying,  
“Sometimes, it becomes impossible to open a page and later alone read messages using the Internet” (Interviewee #5).
- The systems are expensive to maintain especially when it comes to paying for subscriptions annually.
- Power blackouts was a common problem identified by all respondents which affects the way IT systems operate. Once power is off, there is little that can be done in terms of knowledge sharing or accessing knowledge retained in IT systems.



- Librarians pointed out that there is a skills gap in most sections of the library in terms of IT skills. Most staff in the library have received basic IT training which is not adequate to handle complex library systems and sophisticated software.

Both categories of respondents were asked what other challenges besides system related challenges are faced and the following was revealed.

- *Poor Internet connectivity.* Both categories of respondents revealed that there is a general problem of low Internet speeds in the library and the university at large. Low Internet speed does not only affect IT systems but also the flow of information in the library.
- *Fear of dependence.* It was pointed out that quite often, people fear to receive knowledge from their colleagues because they think it is embarrassing to reveal their lack of knowledge/skills in certain areas. They think they will be laughed at if they ask about what they do not know.
- *The negative attitude of staff.* It was pointed out that the attitude of staff towards any changes in the library is still negative. According to the respondents, knowledge sharing and retention are new concepts in the library that staff are not aware of. It was further noted that this lack of awareness brings about a negative attitude towards knowledge sharing and retention in the library.
- *Big numbers of library staff in relation to IT equipment.* As shown above in 4.3.1 *Description of information technologies at Makerere University Library*, it was noted that the number of librarians is bigger in relation to IT equipment in the library which in a way kills staff morale towards the use of such systems. It was established from the respondents that inadequate IT equipment negatively impacts on knowledge sharing and retention in the library.
- *The fear of losing the benefits of having certain knowledge.* Several IT staff and librarians revealed that one of the challenges in knowledge sharing and retention is the fact that people fear that they will lose the advantage of having particular knowledge if they share it with others. This leads to holding back important knowledge that would otherwise be useful to others.

The challenges presented above emanate from the IT systems that are applied in knowledge sharing and retention at Makerere University. The views of the IT staff mainly focus on the systems themselves while the views of the librarians focus on the challenges of using the systems. Some of the challenges above are confirmed in literature under 2.2.5 *Challenges in knowledge sharing and*

*retention* where it is noted that poor Internet connection in organisations is a great hindrance to knowledge sharing hence slowing down the process of sharing knowledge between experts and collaboration over geographically dispersed locations in a virtual environment (Young, 2010:64). It is further noted that employees in organisations believe that knowledge is power and that if shared, they may lose this power which could weaken their career progression (Bender and Fish, as cited in Peterson, 2012:75; Ramirez, 2007: Online). The challenge of fear of dependence is in line with what is covered in literature under 2.2.5 *Challenges in knowledge sharing and retention* that some employees fear to receive knowledge from others because they do not want to feel dependent on others (Ramirez, 2007:Online).

#### **4.5.5 IT support services in the library**

Both the IT staff and librarians were asked related questions about IT support services in order to establish the frequency of inquiries about IT systems as well as the kind of inquiries made. The findings about IT support services are discussed below under C.1 and C.2 in representation of the IT staff and librarians respectively.

##### **C.1**

The IT staff were asked how often they get enquiries from librarians about existing IT systems and they revealed that the inquiries are received from librarians whenever there is need to solve a problem. They revealed that there are no statistics for such inquiries. One of the respondents was quoted saying that,

“At the moment, there are no statistics but inquiries are received only when need arises”  
(Interviewee #6).

##### **C.2**

Whereas the IT staff were asked how often they get inquiries from librarians about existing IT systems, the librarians on the other hand were asked how often they use IT support services. In response to this question, the librarians pointed out that they only use IT support services when the need arises.

From what has been presented above about IT support services, it is noted that it is not easy to determine the frequency of usage of IT support services. Furthermore, it is noted that the librarians' views confirm what the IT staff revealed that they receive inquiries from librarians when a need arises. The lack of statistics as revealed by IT staff could be a challenge as it could easily lead to

duplication of effort if the same inquiry is received several times and there is no record of it.

#### **4.6 Proposed solutions to address information technology challenges in knowledge sharing and retention**

This section was included to find out from IT staff and librarians the recommended solutions for addressing the challenges faced in the application of IT in knowledge sharing and retention at Makerere University Library. The proposed solutions are presented and discussed below.

##### **4.6.1 What is being done to address IT challenges in knowledge sharing and retention in the library**

When the respondents were asked what is being done to address IT challenges in knowledge sharing and retention in the library, the following was revealed.

- It was established that library management is sensitising staff about the importance of uploading their knowledge online for others to access it whenever the need arises
- Furthermore, the respondents pointed out that there is increased lobbying for bandwidth for the library as the central unit of knowledge at the university.
- Training was identified among what is being done to address IT challenges in knowledge sharing and retention in the library. It was noted that the library sends its staff for different kinds of training in the field of IT. It was further noted that since the beginning of 2011, the library has recommended eight librarians for a scholarship to pursue a Master in Information Technology at the University of Pretoria which has equipped the staff with both IT skills and a good understanding of knowledge sharing and retention.

It should be noted from the above, that although what is being done is good for the library, it does not directly address the challenges of application of IT in knowledge sharing and retention because knowledge management is not formally recognised at Makerere University Library. Further suggestions on what can be done are presented and discussed below.

##### **4.6.2 What librarians should do to promote the application of IT in knowledge sharing and retention**

The librarians were asked what they were doing to promote the application of IT in knowledge sharing and retention and the following was noted:

- It was proposed that librarians at the Makerere University Library need sensitisation about the importance of knowledge sharing and retention. This would create more awareness

about knowledge sharing and retention which would in turn improve on knowledge sharing and retention practices in the library.

- It was noted that librarians should attain skills in the use of IT tools that facilitate knowledge sharing and retention. It was further noted that librarians who have at least tried to apply IT in knowledge sharing should be rewarded so that others are motivated to do the same.

The suggestions above are an indication that knowledge sharing and retention at Makerere University Library can be improved especially if awareness is created among library staff. It would even be better if the librarians who know about the concepts of knowledge sharing and retention would sensitise other colleagues about the same issue.

#### **4.6.3 The role of the IT staff in addressing IT challenges in knowledge sharing and retention at the library**

The respondents were asked different questions within their respective categories and below is what each category revealed.

##### **C.1**

The IT staff were asked about the plans they have in terms of addressing IT challenges in knowledge sharing and retention in the library. In this regard, the IT staff provided the following information:

- The IT staff revealed that they are planning to do continual upgrading of the existing IT systems in the library to keep abreast with new IT trends.
- Training of library staff was among the plans of the IT staff in addressing IT challenges in knowledge sharing and retention in the library. The IT staff revealed that they were planning to train library staff in the use of IT systems which could easily be utilised in sharing and retaining knowledge.

##### **C.2**

Librarians were asked what they think the IT department in the library can do to promote knowledge sharing and retention. The following ideas were revealed:

- *Create a database for knowledge sharing and retention.* In support of this strategy, one of the respondents said that,  
“Given that there is no formal knowledge management in the library, the IT department could start with encouraging staff to always put their presentations in soft copy format so that the IT department can perhaps create a database where these files can be shared and retained for future reference” (Interviewee #1).

- *Training of librarians.* It was noted that it is important that the IT department trains the librarians in the use of IT for knowledge sharing and retention through skills/knowledge development so that people can adequately use IT systems.
- *Make IT systems accessible to library staff.* The librarians suggested that the IT staff should make sure that the IT systems are accessible to the staff at all times so as to motivate them to use IT systems.

From the presentation above that is about the role of the IT staff in addressing IT challenges in knowledge sharing and retention in the library, it should be noted that among the plans of the IT staff, was the need to train librarians. This same issue was acknowledged by librarians who agreed that the IT department should focus on training the librarians in order to equip them with adequate IT skills for application of IT in knowledge sharing and retention. The suggestion of training librarians is, therefore, of paramount importance among other suggestions mentioned above.

#### **4.6.4 Strategies by library management to foster the application of IT in knowledge sharing and retention**

All the respondents were asked questions related to what strategies/initiatives library management can adopt to foster application of IT in knowledge sharing and retention as well as how such strategies can be implemented and sustained. The suggested strategies from both categories were similar and are presented and discussed below:

- *Create awareness.* It was suggested that library management should endeavour to create awareness about knowledge sharing and retention and the benefits that accrue from such practices.
- *Rewarding those who share knowledge using IT.* All the respondents suggested that there should be a reward system for all the library staff who use IT to widely share knowledge with colleagues.
- *Foster a culture of knowledge sharing through transparency and trust at work.* It was suggested that library management should instil a knowledge sharing culture through creating diverse teams in the library and encouraging transparency and trust among teams.
- *Make available the necessary IT tools that facilitate knowledge sharing and retention.* It was proposed that library management should ensure availability of IT tools for knowledge sharing and retention.
- It was suggested that the library staff should be sponsored for further studies or short courses in knowledge management.

- It was recommended that the library should build formal knowledge management systems to promote knowledge sharing and retention in a formal way across all units of the library.
- It was finally suggested that library management should make it mandatory for staff to store their reports/handover reports/workshop reports or any kind of report within the library database so that others can have access.
- In terms of implementation and sustainability of the above strategies, the respondents pointed out that the library should start by creating awareness about knowledge management to all staff and allocate enough funds for knowledge sharing and retention initiatives in the library.

All the above suggestions on what library management should do to foster application of IT in knowledge sharing and retention are important for the library. The need to share and retain knowledge at all costs is great in organisations and thus Makerere University Library should realise such a need. It was noted from the above presentation that library management should create awareness about knowledge sharing. This same view is documented in literature under *2.3.1 The importance of knowledge sharing in organisations/academic institutions* where White (2004: Online) posits that if library management makes an effort to create awareness about knowledge sharing, staff are likely to engage in the practice and thus improve effectiveness. Furthermore, under *2.3.1 The importance of knowledge sharing in organisations/academic institutions*, it is noted that knowledge sharing should be embraced by different organisations including academic libraries to improve job performance and lead to organisational effectiveness as a benefit from what the employees know (Probst, Raub & Romhardt, 2000:64; WidenWulf & Soumi, 2007:47).

In addition, it is recommended above that library management should build formal knowledge management systems. This is in line with what is in the literature under *2.4 The role of academic libraries in knowledge sharing and retention* that it is important for libraries to build knowledge management systems in this knowledge age to facilitate capture, preservation and sharing of knowledge and it is necessary for such systems to be built upon a well-constructed infrastructure of information technology including computers and the Internet to ensure effective capture, sharing and retention of knowledge (Lee, 2005: Online; Townley, 2001:6).

#### **4.6.5 Other opinions from respondents**

The respondents were lastly asked if they had any other opinions not covered above that may influence the study and some of the opinions include the following:

“There should be a formal criterion for the IT staff to evaluate investment of resources in IT for knowledge sharing and retention in the library” (Interviewee #1).

“The idea of capturing and retaining tacit knowledge should be recognised as great need by the library whereby sharing and retention of such knowledge should transcend all the IT units in the library” (Interviewee #2).

From the opinions above, it should be noted that keeping statistics of various activities including the evaluation of investment of resources in IT for knowledge sharing and retention is an important activity. Further still capturing tacit knowledge in a formal manner is important for the library to avoid loss of important knowledge when staff leave the library.

#### **4.7 Conclusion**

This chapter has presented and discussed key findings of the empirical study. The findings were obtained mainly from interviews and more information was derived from document content analysis. The findings from interviews of both IT staff and librarians were presented according to the research sub-problems under different themes.

Similar findings from both the IT staff and librarians were discussed together while different findings from the two categories of respondents were discussed separately under C.1 and C.2 to represent IT staff and librarians respectively. Furthermore, different colours were used to represent the direct opinions of the IT staff and librarians; blue colour was used to represent the direct opinions of IT staff in the library while magenta was used to represent the direct opinions of librarians at Makerere University Library.

Lastly, it is important to note that the findings were discussed in relation to the literature under the relevant sections in chapter two. A summary of major findings of the study, conclusions, recommendations and areas for further research are discussed in chapter five.

## CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

*If a man will begin with certainties,  
he shall end in doubts: but if he will be  
content to begin with doubts, he shall end in certainties*

*Sir Francis Bacon (1561-1626)*

### 5.1 Introduction

This is the final chapter of the mini-dissertation and it presents the summary of major findings of the empirical study in accordance with the research sub-problems as presented and discussed according to the relevant literature findings in chapter four. This chapter further presents conclusions, recommendations and areas for further research.

The study dealt with an assessment of the enabling role of information technology in knowledge sharing and retention in Academic Libraries with Makerere University Library as the case study. In The study sought to provide solutions to the four research sub-problems as identified in *1.3 Problem statement* which included: the relationship between information technology and proper acquisition and storage of knowledge; promoting a knowledge sharing culture using information technology; building information technology based knowledge sharing and retention systems; and addressing information technology challenges in knowledge sharing and retention in academic libraries. The above sub-problems were identified in a bid to answer the main research problem which was the relationship between information technology competency and knowledge sharing and retention in academic libraries for purposes of retaining key organisational knowledge.

Conducting the study was based on a qualitative research approach. Due to the qualitative nature of the study, the findings were obtained by use of research methods deemed appropriate for qualitative data collection and these included interviews and document content analysis. Interviews were mainly used while document content analysis provided supplementary information to support what was obtained from the interviews. The interviews were conducted with six IT staff and six librarians from Makerere University Library.



## **5.2 Summary of major findings**

This section presents a summary of major findings of the empirical study based on the research sub-problems mentioned in *5.1 Introduction* above. It should be noted that the major findings are summarised in relation to literature as discussed in chapter four. Below is a summary of the major findings of the study.

### **5.2.1 Information technology for knowledge acquisition and storage at Makerere University Library**

This section was meant to answer the first research sub-problem which was the relationship between information technology and proper acquisition and storage of knowledge. Under this section, the study found that Makerere University Library has in place various types of information technologies including hardware, software and networks but only a few of the hardware devices were available for use for the library staff. Furthermore, the IT staff revealed that there were several IT tools applied in knowledge storage including the institutional repository, databases, backup servers in remote locations as well as cloud storage tools such as Google Drive and Dropbox. Similarly, librarians revealed that the institutional repository, databases and computer hard disks were used as tools for knowledge storage. Other storage mechanisms revealed by librarians included storing documented knowledge in files and boxes in the archives. It was agreed by both IT staff and librarians that the institutional repository was the main IT tool applied in knowledge storage. It was noted that the institutional repository was used by means of self archival and library staff uploading knowledge resources using Dspace software.

It was established from the literature in *2.5 The link between information technology and knowledge management* that there is an existing link between knowledge management initiatives and information technology and in *2.4 The role of academic libraries in knowledge sharing and retention*, *2.5.1 information technology for knowledge acquisition and storage* and *2.5.2 Information technology for knowledge sharing* that tools such as the institutional repository and databases were important tools for storing organisational knowledge.

The study further discovered numerous challenges faced in the application of IT in knowledge acquisition and knowledge storage. In the case of knowledge acquisition, it was noted that there is lack of IT equipment; lack of skilled IT staff; limited bandwidth; old equipment; negative attitude

of staff towards the use of IT for acquisition of knowledge resources; and limited participation of staff in the use of IT in knowledge acquisition. In terms of knowledge storage, the challenges identified include limited storage space; poor connectivity; migration challenges; copyright issues; and limited submissions of knowledge resources to IT systems.

In regard to the challenges above, the respondents suggested a number of solutions in line with both knowledge acquisition and knowledge storage. To begin with knowledge acquisition, it was suggested that there should be increased funding towards the purchase of IT equipment, staff training, recruitment of competent IT staff and increased bandwidth for the library. In the case of knowledge storage, it was suggested that there should be regular software updates whenever the need arise, allocation of more server space to the library, publicising of the institutional repository and devising multiple means of storing knowledge.

In relation to the above, literature in 2.2.2 *An understanding of knowledge management processes* confirms that the challenges above relating to knowledge acquisition can be solved if there is proper application of IT which means that IT related solutions should be formulated for proper knowledge acquisition in the library.

### **5.2.2 Information technology and a knowledge sharing culture**

Sub-problem two was: promoting a knowledge sharing culture using information technology and it was revealed under this sub-problem that both IT staff and librarians share practice-based knowledge, knowledge from project experiences and business processes. In addition, the librarians revealed that they share knowledge from training, workshops, seminars and conferences attended, new library policies, library strategic decisions, procurement of library tools, and important communication from superiors. It was further found that the knowledge above is shared through conversations, written documents and instant messaging. It was noted that the experts pass on vital knowledge through training, dissemination seminars, workshops and conferences, mentoring, as well as written reports. The study, however, could not easily determine whether knowledge is shared daily, weekly, monthly, quarterly or annually because it was found that knowledge is shared when need arises mainly because the issue of knowledge sharing and retention is not formally recognised at the library and thus there are no statistics to that effect.

In addition, the conditions and incentives for knowledge sharing were identified; the former included a conducive knowledge sharing environment, a knowledge dissemination policy and interactive networks while incentives identified included recognition, training, a reward system and promotion. The study further revealed various IT tools that are used to promote a knowledge sharing culture. These tools included social media tools, intranet, library website and institutional repository.

In relation to literature in *2.2.1 An understanding of knowledge*, it is revealed knowledge can be shared formally or informally which means that there is both explicit and tacit knowledge as is the case with Makerere University Library. Some of the methods for sharing such knowledge as confirmed in literature under *2.5.2 Information technology for knowledge sharing* include written documents, conversations, mentoring and instant messaging. Examples of conditions and incentives that facilitate knowledge sharing that exist in literature under *2.3.2 The importance of knowledge retention in organisations* include interactive networks and reward systems while the tools that promote a knowledge sharing culture include the intranet and the library website as shown in literature under *2.5.2 Information technology for knowledge sharing*.

### **5.2.3 Information technology based knowledge sharing and retention systems**

Under sub-problem three which was building information technology based knowledge sharing and retention systems, it was established that various IT tools/systems are applied in knowledge sharing and retention at Makerere University Library. Notably, Virtua ILS, intranet, institutional repository, Google applications and social media tools were identified. However, it was noted that the application of Virtua ILS in knowledge sharing and retention is minimal. In general the study revealed that the utilisation of the systems above is negligible because there is no formal recognition of knowledge sharing and retention in the library.

In order to improve on the utilisation of the above systems/tools, the IT staff revealed that librarians require basic programming skills, data curation skills, database management skills, and end user management skills and recommended that librarians should have training in networking technologies; use of cloud services; use of library software; and web content management. On the other hand, the librarians revealed that they require more training in data entry, searching, system navigation, saving and retrieving data, user profiles' access, database management and special training in automation of libraries on top of the skills they apply in utilisation of the IT systems in

place.

Systems that present challenges in knowledge sharing and retention were identified as Virtua ILS and the institutional repository. More still, challenges in knowledge sharing and retention were identified in the study and these included inaccessibility of systems due to poor network access, the costly venture of maintaining systems and inadequate training in the use of IT systems. Other challenges identified included poor Internet connectivity, fear of dependence, negative attitude of staff, less IT equipment in relation to staff numbers and the fear of losing knowledge.

In relation to inquiries from librarians to IT staff about IT systems, it was established from the IT staff that inquiries from librarians are made only when the need arises. This was confirmed by the librarians. It was difficult to determine the frequency of the inquiries as there are no statistics kept in that regard.

It is confirmed in literature under 2.5.2 *Information technology for knowledge sharing* and 2.5.3 *Information technology for knowledge retention* that some of the tools applicable to knowledge sharing and retention include electronic emails and social media tools such as blogs. It is further noted in literature under 2.2.5 *Challenges in knowledge sharing and retention* that some of the challenges revealed in the findings make knowledge sharing and retention a difficult task. Some of these challenges include poor Internet connection, fear of losing the benefits of having certain knowledge, and fear of dependence.

#### **5.2.4 Proposed solutions to address information technology challenges in knowledge sharing and retention**

The study identified challenges in the application of IT in knowledge sharing and retention as noted above in 5.2.3 *Information technology based knowledge sharing and retention systems*. This is in line with sub-problem four which addressed information technology challenges in knowledge sharing and retention in academic libraries. The respondents identified what is being done to address the above challenges and it was noted that there is sensitisation of staff about the use of the institutional repository, increased lobbying for bandwidth and training of staff in IT areas.

Suggestions from the IT staff about what librarians should do to address the existing challenges included the following; more sensitisation about the importance of knowledge sharing and retention; and attainment of skills in the use of IT tools that facilitate knowledge sharing and retention. On the other hand, librarians revealed that the IT department should create a database for knowledge sharing and retention; train librarians as well as make IT systems accessible to staff in the library. As part of their plan, the IT staff noted that they intend to continually upgrade the existing IT systems and do more training of librarians.

Lastly, various strategies on what library management should do to foster the application of IT in knowledge sharing and retention were proposed. In light of these strategies, it was proposed that library management should create awareness about knowledge sharing and retention among staff; reward those who share knowledge using IT, foster a culture of knowledge sharing through transparency and trust at work, make available the necessary IT tools that facilitate knowledge sharing and retention, train library staff in knowledge management, build formal knowledge management systems and make it mandatory for staff to store their reports in a library database for others to access.

Some of the proposed solutions above are in line with what is documented in literature under 2.3.1 *The importance of knowledge sharing in organisations/academic institutions* and 2.4 *The role of academic libraries in knowledge sharing and retention*. For instance, creating awareness about knowledge management initiatives and building knowledge management systems are highly recommended under the above mentioned sub-section and section.

### **5.3 Conclusions about the research problem and sub-problems**

This section provides conclusions based on the findings of the study. The conclusions must be based on the facts discovered as noted by Powell (1997: 11) that, “The truth of the conclusion obviously depends on the truth of the premise ....” It is further noted that, “The conclusions should be entirely supported by the data presented” (Leedy & Ormrod, 2010: 296). The conclusions are thus drawn from the findings and are in relation to the research problem and research sub-problems.

### **5.3.1 Sub-problem one: The relationship between information technology for knowledge acquisition and storage at Makerere University Library**

Based on the findings about information technology for knowledge acquisition and storage in Makerere University Library, it can be concluded that information technologies do exist in the library but their application in knowledge acquisition and storage is limited. This could be attributed to the fact that there are inadequate IT equipment for library staff. More still, among the tools identified for knowledge storage, the institutional repository is the most popular which means that it is mostly explicit knowledge that is stored for use in the library. However, even with the existing IT tools, there are challenges that limit the application of IT in knowledge acquisition and storage. It can thus be concluded that there is a relationship between IT and knowledge acquisition and storage in the library but a lot remains to be done in terms of eradicating the existing challenges to strengthen such an application.

### **5.3.2 Sub-problem two: Promoting a knowledge sharing culture using information technology**

As noted from the findings, knowledge in various forms is often shared through different means such as conversations, written documents, instant messaging training; dissemination seminars, workshops and conferences and mentoring. However, it was noted that knowledge sharing and retention as part of knowledge management initiatives are not formally recognised in the library which makes it difficult to keep track of what knowledge is shared and how often such knowledge is shared. The library mainly depends on IT tools such as social media tools, intranet, library website and institutional repository to promote a knowledge sharing culture. Although such tools are used for knowledge sharing and retention, their application is not done in a formal way in relation to knowledge sharing and retention. This, therefore, means that IT is indirectly used to promote a knowledge sharing culture in the library.

### **5.3.3 Sub-problem three: Building information technology based knowledge sharing and retention systems**

Concerning information technology based knowledge sharing and retention systems in the library, the study revealed that various systems/tools are applied in knowledge sharing and retention including Virtua ILS, intranet, institutional repository, Google applications and social media tools. However, the application of such tools in knowledge sharing and retention is minimal because knowledge sharing and retention are not formally known in the library. This means that much as the systems exist, they are not purposely used to share and retain important knowledge in the library.

Furthermore, the forms of training suggested for the librarians in order to utilise the existing systems show that librarians still lack essential skills to utilise the systems.

It was further noted that some of the systems such as Virtua ILS and the institutional repository present challenges in knowledge sharing and retention. To this point, numerous IT related challenges in knowledge sharing and retention were identified in *5.2.3 Information technology based knowledge and retention systems*. This means that the existing systems have to be improved to support knowledge sharing and retention. Non-IT related challenges were also identified in *5.2.3 Information technology based knowledge and retention systems* which also means that efforts should also be focused on addressing the non-IT challenges as they greatly affect knowledge sharing and retention efforts. In regard to the inquiries by librarians to IT staff about IT systems, it was noted that this is only done when the need arises. This shows that librarians have at their disposal IT support in case help is needed which is a move in the positive direction for the library.

It can thus be concluded that Makerere University Library has moved a major milestone in building IT systems but there is little application to knowledge sharing and retention. Therefore, there is need to build formal knowledge sharing and retention systems to preserve important knowledge in the library.

#### **5.3.4 Sub-problem four: Addressing information technology challenges in knowledge sharing and retention**

Various solutions were proposed by the librarians and IT staff about what different parties in the library can do to improve the use of IT in knowledge sharing and retention in the library. It was noted that there is sensitisation of staff about the use of the institutional repository, increased lobbying for bandwidth, and training of staff in IT areas as existing and ongoing solutions. This shows that the library is making an effort to improve the use of IT in knowledge sharing and retention although for the case of knowledge sharing and retention, such effort is indirect due to the informal nature of knowledge sharing and retention. The study further revealed that librarians require more sensitisation about the importance of knowledge sharing and retention and attainment of skills in the use of IT tools that facilitate knowledge sharing and retention. For the IT staff, it was noted that they should create a database for knowledge sharing and retention, train librarians as well as make IT systems accessible to staff in the library. The IT staff revealed that they plan to do continual upgrading of existing IT systems and do more training of librarians. The study further

revealed various strategies that can be implemented by management in order to improve the situation in question as noted in 5.2.4. *Proposed solutions to address information technology challenges in knowledge sharing and retention*

It can thus be concluded that library staff at Makerere University Library do recognise that there are existing challenges in the application of IT in knowledge sharing and retention for which they proposed solutions. All the proposed solutions are crucial to the library if the use of IT in knowledge sharing and retention is to be realised. The library should start by making knowledge sharing and retention formal after which other proposed solutions should follow.

In relation to the main research problem as noted in 1.3 *Problem statement*, it can be concluded that a relationship exists between IT competency and knowledge sharing and retention in academic libraries in the sense that various technologies are applicable to knowledge sharing and retention activities. The major problem that remains in the case of Makerere University Library is that such an application is still done in an informal and indirect manner. Further to note, is that the use of IT presents challenges in knowledge sharing and retention which require strategic solutions. Some of the recommended solutions are discussed below in 5.4 *Recommendations*.

## **5.4 Recommendations**

The study identified various challenges faced in the application of IT in knowledge sharing and retention at Makerere University library. As a way of addressing the identified challenges, the study recommends the following.

### **5.4.1 Creation of awareness about knowledge sharing and retention practices**

In reference to 4.5.4 *Challenges in knowledge sharing and retention*, a challenge pertaining negative attitude of staff due to limited awareness about knowledge sharing and retention practices was identified. In this regard, the study recommends creation of immense awareness about knowledge sharing and retention practices by library management. This is because if the staff do not know about such practices, they will carry on with the negative attitude and can hardly engage in sharing of knowledge for purposes of retaining it. In addition, the use of IT in knowledge sharing and retention should be popularised among all library staff.



#### **5.4.2 Implementation of a knowledge retention policy**

It was noted in 4.4.4 *The conditions and incentives for knowledge sharing*, that knowledge sharing is not a formally recognised activity at the library. The study, thus, recommends that Makerere University Library should implement a knowledge retention policy to formally and legally recognise knowledge retention practices. This policy should focus on how knowledge of experts can be captured and preserved by use of IT systems or tools so that even when they leave or retire from the organisation, their knowledge can be retrieved and reused by other employees. Therefore, there should be ways of identifying the existing experts in the library as well as various means of capturing such knowledge for retention purposes. One of the ways for capturing such knowledge may include attachment of different experts to different sections in the library so as to teach other staff what they know. As such, coaching and mentoring programmes should be put in place as well as succession planning. This policy can be a good starting ground to retaining important organisational knowledge.

#### **5.4.3 Establishment of a knowledge management section in the library**

Due to the informal nature of knowledge sharing and retention in the library as noted in 4.4.4 *The conditions and incentives for knowledge sharing*, the study recommends establishment of a knowledge management section in the library. Such a section should have a leader who should coordinate the work of other knowledge workers in the library. This section should work closely with the IT department to ensure that knowledge sharing and retention are taken seriously as part of knowledge management practices and that IT is used to enhance such practices. The section should emphasise the importance of knowledge sharing among staff in order to pass on vital knowledge which can be lost forever if or when staff leave.

#### **5.4.4 Purchase of more IT equipment for library staff**

The study established that there were inadequate IT equipment for all the staff in the library which negatively impacts on knowledge sharing and retention as seen in 4.5.4 *Challenges in knowledge sharing and retention*. In relation to this problem, the study, therefore, recommends that the library makes effort in improving the IT infrastructure especially computing facilities and access to the Internet for all library staff. The library should write proposals for funding so as to facilitate the purchase of IT equipment for all librarians.

### **5.5.5 Building IT knowledge bases for library staff**

It was noted in 4.5.4 *Challenges in knowledge sharing and retention* that the existing systems in the library present challenges in knowledge sharing and retention which necessitates the building of IT knowledge bases for library staff. Knowledge bases in this case are regarded as systems that collect knowledge of different staff about different subjects or activities. Staff should be encouraged to utilise facilities such as shared databases which can be used to preserve important knowledge..

### **5.5.6 Improve network access in the library**

The study revealed in 4.5.4 *Challenges in knowledge sharing and retention* that there is poor network connectivity in the library which affects knowledge sharing and retention in the library. This poor network is attributed to limited bandwidth in the library. The study recommends that library management should allocate more money to improving connectivity in the library. This will ensure that IT systems are not greatly affected by poor network problems as currently is the situation.

### **5.5.7 Continual staff training**

The study recommends that there should be rigorous efforts devoted to staff training in the library to solve an existing problem of lack of enough training in the use of IT systems in knowledge sharing as identified in 4.5.4 *Challenges in knowledge sharing and retention*. This is due to the fact that although IT systems are in place, staff do not use them because they are not well trained to use them. The study, therefore, recommends that library management should implement training programmes for staff in the area of IT and knowledge management practices especially knowledge sharing and retention practices.

### **5.5.8 Establish a retiree's legacy programme**

Although the respondents did not specifically identify a problem relating to lack of a retirees' legacy programme, the researcher deems it necessary for library to institute measures to capture knowledge of all senior staff who are eligible for retirement. It is thus vital that such staff are identified early enough so that they do not exit the library with important knowledge. To this point, the library should consider implementing a retiree's legacy programme which should include activities such as documentation and interviews to capture critical knowledge at least six months before the staff leave the library. It should be a requirement for eligible retirees to document the

workflow processes of their jobs while additional efforts should be geared towards gaining additional work related knowledge from experts through interviews. Information technologies such as video recorders and computers should be applied to ease the process of carrying out such documentation work and interviews. It is further important for such documentation work and interviews to be well preserved in the IT knowledge bases for library staff as proposed in 5.5.6 *Building IT knowledge bases for library staff* above.

## **5.5 Areas for further research**

As already mentioned above in 5.1 *Introduction*, the study aimed at assessing the enabling role of information technology in knowledge sharing and retention in academic libraries with Makerere University Library as the case study. Based on this study, the researcher suggests the following areas for further research:

- A comparative study on IT as an enabler in knowledge sharing and retention between academic libraries and other types of libraries. This kind of study would reveal different practices by different types of libraries in regard to knowledge sharing and retention. The comparison would widen the knowledge base in the area of knowledge sharing and retention.
- The researcher did not have time and funds to investigate all the knowledge management processes and because of this, it would be important to assess the enabling role of IT in other knowledge management processes such as generation/creation, and knowledge application in academic libraries. This kind of study would show a different perspective of the enabling role of IT in knowledge management processes.
- This study adopted a qualitative research approach which helped the researcher gain an understanding of the situation at Makerere University Library in regard to the enabling role of IT in knowledge sharing and retention. It is recommended that further quantitative studies be carried out on the topic of IT as an enabler in knowledge management practices in academic libraries.

## **5.6 Final conclusion**

As noted in chapter one, this research was based on one main research problem and four research sub-problems. In this regard, the study followed a systematic methodology discussed in chapter three upon which the empirical study was conducted in order to provide answers in relation to the research sub-problems as discussed in chapter four in accordance to literature review reflected in

chapter two.

This being the final chapter of the research has presented the summary of the major findings, conclusions, recommendations and areas for further research. Based on the above, it can be concluded that the study has shown that Makerere University Library has deployed various information technologies for library work but utilisation of such technologies in knowledge acquisition, storage, sharing and retention is still minimal. The information technologies which are used in the above mentioned knowledge management activities present various challenges which need to be addressed. This shows that there is need for a coordinated effort between the IT staff, librarians and library management in harnessing the culture of knowledge sharing using IT in order to retain important knowledge in the library.

It was further revealed that knowledge sharing and retention are not formally recognised at Makerere University Library which hampers the 'would be' efforts in knowledge sharing and retention. This means that means of capturing experts' knowledge are not clearly defined in the library since the methods that exist are not formally recognised for the purpose of knowledge retention.

The study, therefore, recommends implementing a knowledge retention policy, establishment of a knowledge management section in the library, purchase of more IT equipment for library staff, establishment of knowledge sharing platforms, building IT knowledge bases for library staff, improving network access in the library and continual training of library staff.

As an inspiration drawn from the findings of this study, carrying out a study between different academic libraries, studying other knowledge management processes in the same context, and carrying out quantitative studies on IT as an enabler in knowledge management practices in academic libraries are areas recommended for further studies.

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## **APPENDICES**

### **Appendix A: Interview guide for Information technology staff**

#### **INTERVIEW GUIDE FOR INFORMATION TECHNOLOGY STAFF IN MAKERERE UNIVERSITY LIBRARY**

##### **Introduction**

My name is Dianah Kacunguzi Twinoburyo, a student at the University of Pretoria pursuing a Master in Information Technology. In partial fulfilment of the programme, I am undertaking a research project titled “An assessment of the enabling role of Information Technology in knowledge sharing and retention in academic libraries: A case study of Makerere University Library”. Knowledge, for the sake of this interview, entails the theoretical as well as the practical understanding of a subject. It may thus include knowledge from written documents or knowledge acquired through experience and training.

Your responses from this interview will be used for only academic purposes and will be treated with utmost confidentiality. The participants in this particular interview are information technology (IT) staff in Makerere University Library.

##### **Scope of the interview**

The questions asked in this interview are correlated with the main research problem in the study and are based on the four research sub-problems that will guide the study namely: the relationship between information technology and proper acquisition and storage of knowledge, promoting a knowledge sharing culture using information technology, building information technology based knowledge sharing and retention systems, as well as addressing information technology challenges in knowledge sharing and retention in academic libraries.

##### **Section A: Demographic Information**

1. In which section of the library are you currently working?
2. What is your position or rank?
3. For how long have you worked at the library?

## **Section B: The relationship between information technology and proper acquisition and storage of knowledge**

1. Which information technologies are used in the library? (hardware, software, networks etc)
2. Which IT tools have been deployed for knowledge storage by the library?
3. How are IT tools being applied for storage of knowledge?
4. What challenges are generally encountered in the application of IT in knowledge acquisition in the library?
5. What challenges exist in regard to the application of IT in knowledge storage in the library?
6. What can be done to address the above challenges?

## **Section C: Promoting a knowledge sharing culture using information technology**

1. What knowledge is shared among IT staff in the library? (practice based; project experience; business processes, etc).
2. How is knowledge generally shared among IT staff in the library? (conversations, written documents etc).
3. How often do you share knowledge with other IT staff in the library? (daily, weekly, monthly, as need be etc)
4. When do you share knowledge? (during meetings, when need arises, when asked)
5. What conditions do you think facilitate knowledge sharing in the library?
6. What incentives are there for knowledge sharing? (recognition, bonus, promotion)
7. How is IT being used to promote a knowledge sharing culture in the library?
8. How do the IT experts pass on vital knowledge to other IT staff for the purpose of retaining such knowledge? (seminars, training, discussions etc)

## **Section D: Building IT based knowledge sharing and retention systems**

1. Which IT systems /tools in the library are being used in knowledge sharing? (integrated library system, social software, communication tools etc)
2. Which IT systems are being utilised in knowledge retention?
3. To what extent are the systems utilised in knowledge sharing?
4. What IT skills do you think librarians require in order to utilise such systems?
5. What form of IT training do you suggest for librarians?
6. What systems present challenges in knowledge sharing and retention in the library?
7. What other challenges exist in relation to knowledge sharing and retention in the library?
8. How often do you get enquiries from librarians about existing IT systems?
9. What kinds of enquiries are often made by librarians about existing IT systems? (searching,

navigation etc)

**Section E: Addressing IT challenges in knowledge sharing and retention in academic libraries**

1. What is being done to address IT challenges in knowledge sharing and retention in the library?
2. Please suggest strategies that can be adopted by librarians to effectively utilise IT in knowledge sharing and retention.
3. As IT staff in the library, what plans do you have in terms of addressing IT challenges in knowledge sharing and retention in the library?
4. What strategies can be adopted by library management to foster the application of IT in knowledge sharing and retention? How can such strategies be implemented and sustained?
5. Have you got any other opinions not covered above that may influence the study?

**Thank you for your participation in the interview.**

## **Appendix B: Interview guide for librarians**

### **INTERVIEW GUIDE FOR LIBRARIANS IN MAKERERE UNIVERSITY LIBRARY**

#### **Introduction**

My name is Dianah Kacunguzi Twinoburyo, a student at the University of Pretoria pursuing a Master in Information Technology. In partial fulfilment of the programme, I am undertaking a research titled “An assessment of the enabling role of Information Technology in knowledge sharing and retention in academic libraries: A case study of Makerere University Library”. Knowledge, for the sake of this interview, entails the theoretical as well as the practical understanding of a subject. It may thus include knowledge from written documents or knowledge acquired through experience and training.

Your responses from this interview will be used for only academic purposes and will be treated with utmost confidentiality. The participants in this particular interview are librarians in Makerere University Library.

#### **Scope of the interview**

The questions asked in this interview are correlated with the main research problem in the study and are based on the four research sub-problems that will guide the study namely: relationship between information technology and proper acquisition and storage of knowledge, promoting a knowledge sharing culture using information technology, building information technology based knowledge sharing and retention systems, as well as addressing information technology challenges in knowledge sharing and retention in academic libraries.

#### **Section A: Demographic Information**

1. In which section of the library are you currently working?
2. What is your position or rank?
3. For how long have you worked at the library?

#### **Section B: Relationship between information technology and proper acquisition and storage of knowledge**

1. In general, which information technologies are used in the library? (hardware, software, networks etc)
2. a) Which IT tools are being applied in knowledge storage by the library?  
b) What other knowledge storage mechanisms exist in the library? (e.g. physical files)

3. How are IT tools applied in storage of knowledge?
4. What challenges do you encounter in regard to the application of IT in knowledge acquisition in the library?
5. What challenges exist in relation to the application of IT in knowledge storage in the library?
6. What do you think should be done to address the above challenges?

### **Section C: Promoting a knowledge sharing culture using information technology**

1. What knowledge do you share with colleagues? (practice based; project experience; business processes, etc).
2. How do you share knowledge with other colleagues? (conversations, written documents etc)
3. How often do you share knowledge with colleagues? (daily, weekly, monthly, as need be etc)
4. When do you share knowledge? (during meetings, when need arises, when asked)
5. What conditions do you think facilitate knowledge sharing in the library?
6. What incentives are there for knowledge sharing? (recognition, bonus, promotion)
7. How is IT being used to promote a knowledge sharing culture?
8. How do the library experts pass on vital knowledge to other library staff for the purpose of retaining such knowledge? (seminars, training, discussions etc).

### **Section D: Building IT based knowledge sharing and retention systems**

1. Which IT systems / tools do you apply in knowledge sharing and retention? (integrated library system, social software, communication tools etc).
2. Which IT systems / tools do you apply in knowledge retention in the library?
3. To what extent do you think librarians utilise the existing IT systems for knowledge sharing and retention?
4. What IT skills do you apply in the utilisation of library IT systems?
5. What form of training do you require to enable you to effectively utilise library systems?
6. What challenges do you experience in using IT systems in knowledge sharing and retention in the library?
7. What other challenges do you experience in relation to knowledge sharing and retention in the library?
8. How often do you use IT support services? (when need arises, daily, weekly etc)
9. What common questions do you normally ask the IT staff about the IT systems? (searching, navigation etc)

### **Section E: Addressing IT challenges in knowledge sharing and retention**

1. What is being done to address IT challenges in knowledge sharing and retention in the library?
2. What do you think librarians ought to do to promote the application of IT in knowledge sharing and retention in the library?
3. What do you think the IT department in the library can do to promote knowledge sharing and retention?
4. What initiatives do you think the library management should put in place to foster the use of IT in knowledge sharing and retention? How can such initiatives be implemented and sustained?
5. Have you got any other opinions not covered above that may influence the study?

**Thank you for your participation in the interview.**



## **Appendix C: Document content analysis guide**

Below is the list of documents that were analysed to obtain additional data for the study:

1. Makerere University Library Strategic Plan 2007-2017
2. Staff instructional manuals
3. Section reports